Woodworth, Robert Sessions,
Archives of psychology. --
R.W.B. JACKSON LIBRARY
3 0005 03037 6308
OISE CIR

The Goodenough Drawing in Relation to Delinquency and Problem Behavior

BY
WILLIAM ERNEST HINRICHS, Ph.D.

ARCHIVES OF PSYCHOLOGY
R. S. WOODWORTH, Editor
No. 175

150.8
A673
no. 175

NEW YORK
January, 1935

LIBRARY
FEB 21 1973
THE ONTARIO INSTITUTE
FOR STUDIES IN EDUCATION
DEPARTMENT OF PSYCHOLOGY
LIBRARY
UNIVERSITY OF PORTLAND

ARCHIVES OF PSYCHOLOGY

COLUMBIA UNIVERSITY, NEW YORK CITY

The Subscription price is six dollars per volume of about 500 pages. Volume I comprises Nos. 2–10; Volume II, Nos. 11–18; Volume III, Nos. 19–25; Volume IV, Nos. 26–32; Volume V, Nos. 33–39; Volume VI, Nos. 40–46; Volume VII, Nos. 47–52; Volume VIII, Nos. 53–58; Volume IX, Nos. 59–63; Volume X, Nos. 64–68; Volume XI, Nos. 69–73; Volume XII, Nos. 74–78; Volume XIII, Nos. 79–85; Volume XIV, Nos. 86–91; Volume XV, Nos. 92–98; Volume XVI, Nos. 99–104; Volume XVII, Nos. 105–112; Volume XVIII, Nos. 113–120; Volume XIX, Nos. 121–127; Volume XX, Nos. 128–133; Volume XXI, Nos. 134–139; Volume XXII, Nos. 140–146; Volume XXIII, Nos. 147–154. Volume XXIV, Nos. 155–162. Volume XXV, Nos. 163–170. The available numbers are as follows:

17. Relative Merit of Advertisements: E. K. Strong, Jr. $1.00.
18. Attention and Movement in Reaction Time: J. V. Breitweiser. 50c. (Cl., 75c.)
19. Empirical Study of Certain Tests for Individual differences: M. T. Whitley. $1.25. (Cl., $1.50.)
20. Visual Acuity with Lights of Different Colors and Intensities: D. E. Rice. 50c. (Cl., 75c.)
21. Curve of Forgetting: C. H. Bean. 45c. (Cl., 75c.)
23. Reaction Time to Retinal Stimulation: A. T. Poffenberger. 70c. (Cl., 95c.)
24. Interference and Adaptability: A. J. Culler. 75c. (Cl., $1.00.)
25. Reaction to Multiple Stimuli: J. W. Todd. 60c. (Cl., 85c.)
26. Study in Incidental Memory: G. C. Myers. $1.00. (Cl., $1.25.)
27. Statistical Study of Eminent Women: C. S. Castle. 80c. (Cl., $1.05.)
28. Mental Capacity of the American Negro: M. J. Mayo. 60c. (Cl., 85c.)
29. Experimental Studies in Judgment: H. L. Hollingworth. $1.25. (Cl., $1.50.)
30. Psychological Researches of James McKeen Cattell: A Review by Some of His Pupils. $1.00.
31. Fatigue and Its Effects upon Control: I. E. Ash. 60c. (Cl., 85c.)
32. Transfer of Practice in Cancellation: M. A. Martin. 60c. (Cl., 85c.)
33. Intellectual Status of Children Who are Public Charges: J. L. Stenquist, E. L. Thorndike and M. R. Trabue. 50c. (Cl., 75c.)
34. Quickness of Learning and Retentiveness: D. O. Lyon. 50c. (Cl., 75c.)
35. Overcoming of Distraction: J. J. B. Morgan. 75c. (Cl., $1.00.)
36. Psychology of the Negro: G. O. Ferguson, Jr. $1.25. (Cl., $1.50.)
37. Effect of Distraction on Reaction Time: J. E. Evans. $1.00. (Cl., $1.25.)
38. Effect of Humidity on Nervousness and on General Efficiency: L. I. Stecher. 90c. (Cl., $1.15.)
39. Mechanism of Controlled Association: M. A. May. 75c. (Cl., $1.00.)
41. Mental Fatigue during Continuous Exercise of a Single Function: T. R. Garth. 85c. (Cl., $1.10.)
42. Psychological Study of Trade-Mark Infringement: R. H. Paynter. 85c. (Cl., $1.10.)
43. Individual Differences and Family Resemblances in Animal Behavior: H. J. Bagg. 70c. (Cl., $1.00.)
44. Experiment Studies in Recall and Recognition: E. M. Achilles. 90c. (Cl., $1.25.)
45. Morphologic Aspect of Intelligence: Sante Naccarati. 70c.
47. Effects of Practice on Judgments of Absolute Pitch; E. Gough. $1.25.
48. Experimental Study of Silent Thinking: R. S. Clark. $1.40.
49. Some Empirical Tests in Vocational Selection: H. W. Rogers. 75c.
50. Adenoids and Diseased Tonsils: Effect on General Intelligence: M. Cobb. $1.00
51. Experimental Study of the Factors and Types of Voluntary Choice: A. H. Martin. $1.50.
52. Some Well-known Mental Tests Evaluated and Compared: D. R. Morgenthau. 80c.
53. Mood in Relation to Performance: E. T. Sullivan. $1.00.
54. Influence of Incentive and Punishment upon Reaction Time: A. M. Johanson. 80c.
55. Psychological Tests Applied to Factory Workers: E. T. Burr. $1.25.
56. Study of the Relation of Accuracy to Speed: H. E. Garrett. $1.25.
57. Experimental Study of Hunger in Its Relation to Activity: T. Wada. $1.50.
58. Individual Differences as Affected by Practice: G. S. Gates. $1.00.
59. Studies in Industrial Psychology: E. O. Bregman. 90c.
60. The Mental Status of Psychoneurotics: A. D. Tendler. $1.25.
61. Effects of Attention on the Intensity of Cutaneous Pressure and on Visual Brightness: S. M. Newhall. $1.25.
62. Measurement of Motor Ability: E. G. Garfiel. 90c.
63. Race Differences in Inhibition: A. L. Crane. $1.50.
64. Individual Differences in Incidental Memory: S. M. Shellow. $1.25.
65. Character Traits as Factors in Intelligence Test Performance: W. M. Brown. $1.25.
66. Study of the Sexual Interest of Young Women: F. I. Davenport. $1.25.
67. Psychology of Confidence: W. C. Trow. $1.25.
68. Experimental Studies of College Teaching: H. E. Jones. $1.25.
69. Influence of Intestinal Toxemia on Efficiency: A. E. Paulsen. $1.00.
70. Study of Suggestibility of Children: M. Otis. $1.50.
71. Praise and Reproof as Incentives for Children: E. B. Hurlock. $1.00.
72. Experimental Study of Thinking: E. Heidbreder. $1.75.
74. Estimation of Time: R. Axel. $1.00.
77. Tested Mentality as Related to Success in Skilled Trade Training: T. M. Abel. $1.25.
78. Aggressive Behavior in a Small Social Group: E. M. Riddle. $1.75.
79. Memory Value of Advertisements: E. R. Brandt. $1.25.
80. Critical Examination of Test-Scoring Methods: R. G. Anderson. $1.00.
81. Thermal Discrimination and Weber's Law: E. A. K. Culler. $1.75.
82. Correlational Analysis of Typing Proficiency: L. Ackerson. $1.50.
83. Recall as a Function of Perceived Relations: C. B. Key. $1.25.
84. Consistency of Rate of Work: C. E. Dowd. $1.00.
85. Experimental Investigation of Recovery from Work: S. L. Crawley. $1.25.
86. Facilitation and Inhibition: T. N. Jenkins. $1.00.
87. Variability of Performance in the Curve of Work: J. D. Weinland. $1.00.
88. Mental Hygiene Inventory: S. D. House. $1.50.
89. Mental Set and Shift: A. T. Jersild. $1.25.
90. Experimental Investigation of Rest Pauses: C. W. Manzer. $1.25.
91. Routine and Varying Practice as Preparation for Adjustment to a New Situation: L. W. Crafts. $1.00.
93. Speed and Other Factors in "Racial" Difference: O. Klineberg. $1.50.
94. Relation of Reaction Time to Intelligence, Memory: V. W. Lemmon. 80c.
95. Is the Latent Time in the Achilles Tendon Reflex a Criterion of Speed in Mental Reactions? G. H. Rounds. $1.25.

(Continued on inside back cover.)

The Goodenough Drawing in Relation to Delinquency and Problem Behavior

BY

WILLIAM ERNEST HINRICHS, PH.D.

ARCHIVES OF PSYCHOLOGY
R. S. WOODWORTH, EDITOR
No. 175

LIBRARY
FEB 21 1973
THE ONTARIO INSTITUTE
FOR STUDIES IN EDUCATION

NEW YORK
January, 1935

ACKNOWLEDGEMENTS

There are a number of persons to whom the author is most deeply indebted for suggestions, criticisms, and cooperation without which this study could never have been made.

Dr. Louise E. Poull was a source of constant help and never-failing encouragement; her contribution cannot be overestimated. Professors Robert S. Woodworth and Henry E. Garrett were painstaking in their examination of the rough draft and have contributed greatly to whatever of merit there may be in the organization and statistics of the thesis, and Dr. John P. Seward, Jr., was most helpful in his criticism of the finished manuscript. Messrs. Roy L. McLoughlin, Lewis A. Piper, Herbert W. Dutch, Alfred C. Ramsay, Homer K. Underwood, Lawrence A. Smith were more than generous in opening their schools for testing; Miss Lotta M. Karpeles was equally generous with her case materials. And there are, too, teachers and assistants in all these schools, without whose aid the cooperation of the principals would have been of little avail.

Finally, there are the members of my immediate family who have encouraged me not only by their interest but by carrying a large part of the clerical labor involved. And a host of others, professional and lay, who may find some of their contributions to be vital links in the total argument.

To all of these I subscribe myself as sincerely grateful.

William E. Hinrichs

Glen Ridge, N. J.
January, 1934

TABLE OF CONTENTS

INTRODUCTION 5

CHAPTER I
  Survey of Former Studies of Children's Drawings 7

CHAPTER II
  The Problem in Its Immediate Setting 16
  Summary Glimpse Forward to the Findings 19

CHAPTER III
  The Experiment Described 21

CHAPTER IV
  Findings Relative to the Test Itself
    A. Reliability
    B. What the Drawing Measures
    C. Norms and Age-Levels
    D. Summary 28

CHAPTER V
  Looking Forward to an Extension of the Goodenough Scale 37

CHAPTER VI
  Differences Between Groups, Dependent Upon Drawing Scores
    I. Preliminary Section
    II. Principal Section
      A. Total Groups
      B. IQ Constant
      C. Matched Groups
      D. Summary 43

CHAPTER VII
  Qualitative Differences Between Drawings 56

CHAPTER VIII
  Recapitulation
    I. The Problem
    II. Experimental Procedure
      A. Personnel
      B. Tests Used
      C. Test Administration
    III. Results and Findings
      A. Older Subjects
      B. Extension of Scores
      C. Maturity Measured by Drawings
      D. Score Differences
      E. Qualitative Differences
    IV. Discussion
    V. Conclusions 68

BIBLIOGRAPHY 74

POINTS PROPOSED FOR THE EXTENSION OF THE GOODENOUGH SCALE 76

ABBREVIATED KEY FOR THE 51-POINTS SCALE DEVELOPED BY GOODENOUGH 77

CHARACTERISTICS OF BOYS DRAWING INCONGRUOUSLY 79

APPENDIX 82
  Tables
  Diagrams
  Samples of Boys' Drawings
  Illustrations to Guide in Scoring by Extension

THE LIBRARY

The Ontario Institute
for Studies in Education

Toronto, Canada

INTRODUCTION

When the author entered upon the psychometric work of the Connecticut School for Boys, an institution for delinquents, he was fresh from an experience in the psychological clinic of the New York City Children's Hospital,* a clearing-house for the City's feebleminded. While there he had had frequent occasion to use the Goodenough Drawing Test and had been peculiarly impressed by its close paralleling of the considerably longer Stanford-Binet examination, and by the very slight extent to which coaching or opportunity to copy from models or life influenced the scores. It was quite natural, then, to incorporate it into the battery of tests used at the Connecticut School.

Since the Goodenough test is not widely known, it may be well at this point briefly to introduce it. It is a test of the ''performance,'' as contrasted with the ''language'' type; the task is to draw a man. The subject may draw any kind of man he chooses, in any position; but he is told to draw the whole man and to do the best that he can. The subject's score is arrived at in an objective manner which has been demonstrated to be practically free of bias in favor either of artistic talent or merit, on the one hand, or of practice or instruction in drawing, on the other. Scoring depends on the number of details attempted (such as arms, legs, clothing, etc.), on the degree of muscular control (as indicated by line firmness and line junctions), and on the correctness of relative proportion (within very wide limits). Success in the test of drawing depends on factors which develop side by side with intelligence in the ''normal'' population, and so the test was put forward in 1926 by Florence Goodenough as an alternate to the various intelligence tests then in use.

It soon became evident, however, that the drawings made at the Connecticut School were not gauging the *intelligence* of the delinquent boys, no matter what else they might be indicating. But the results were interesting from a speculative standpoint, at least, and so the test was not abandoned. The vast majority of the drawings were below the general intelligence levels of the boys producing them; some of them exceedingly far below, as judged by the norms used at the NYCCH. Many of them showed marked peculiarities which seemed to fit personal characteristics of the individual boys: a diffident and hesitating boy would make many attempts with frequent erasures, whereas a cocksure youngster would draw quickly with bold lines; a shy and withdrawn individual might make a man in one small corner of his sheet of paper, while another boy would possibly require a second sheet in order to show *his* whole man; a boy with a history indicating profound emotional instability might make a drawing showing the most grotesque incongruities, portraying, for instance, mature characteristics side by side with the most primitively infantile.

---

* Hereafter referred to as the N.Y.C.C.H.

By the end of two years' sporadic use of the Goodenough Drawing, it seemed probable either that the test is inapplicable to the older children used in this study, or that it bears distinct relationship to some factor or factors entering into the picture of delinquency. Does the frequently infantile character of the delinquent's drawings go hand in hand with something under-developed in his personality?

The most reasonable hypothesis, if we should be required to formulate one, would be that the drawing measures something which we might call the *general maturity* of the individual rather than the *general intelligence* measured by such an instrument as the Stanford-Binet. Certainly the impression given by a group of delinquents is that, regardless of mental age, they think and feel and act childishly. In testing this thesis, it will first be necessary to indicate that there is a superiority in the performance of non-delinquent controls; it will then remain to discover what the ability to draw a man may mean. Two lines of thought present themselves in this connection: first, that it may be the sort of maturity represented by maturity of interests, recreations, and ambitions; and, secondly, that it may be the sort of maturity needed for, or indicated by, emotional control. The first of these two lines, only, has been investigated in this study.

The following pages will show how far we are yet from a knowledge of just what the drawing does measure; but it is to be hoped that others will feel the challenge of this simple test as a tool for studying the individual not only from an intellectual, but also from a non-intellectual standpoint, and will take up some of the leads herein indicated. If such be the case, the author's efforts at exploration will be well repaid.

CHAPTER I

SURVEY OF FORMER STUDIES OF CHILDREN'S DRAWINGS

Before attempting to describe the present experiment or to evaluate its findings, it will be well to glance at the historical background from which the immediate problem arises.

Among the earliest references to children's drawings is a study by G. Stanley Hall (26)* reported in 1883 as a contribution to the better fitting of Kindergarten-first-grade instruction to the contents of children's minds. In the course of the investigation, opportunity was given for each child to draw a man, and Hall noticed, among other things, the fact that younger children drew mostly full-face representations, that they drew "logically"—*i.e.,* a face in profile would none the less show both eyes, etc.—and that there are definite levels of development in the ability to portray a man, corresponding to increased development of the individual child.

In 1885, Ebenezer Cooke (12), emphasizing the developmental features characteristic of children's drawings, urged a reform of drawing instruction which might bring that teaching into better harmony with the capacities of the child. In 1887, Ricci (45) undertook to explain the development of children's drawings from the psychological standpoint, and, in the course of his study, showed that in younger children scholastic ability and drawing ability parallel each other closely, but that among older children artistic talent is not at all incompatible with lack of interest in school work, and, in fact, often is associated with poor scholastic performance. Earl Barnes (2), in 1893, published an analysis of several hundred drawings by school children, showing a definite development with age, and suggesting the study of children's interests by means of their drawings.

Following these pioneer works, there came a large volume of studies, quite fully indicated in the bibliographies given by Goodenough (23) (24), by Ayer (1) and by Eng (19). The present author will content himself with a brief survey touching only on the high spots having immediate reference to his own problem, and will refer the reader desiring a fuller discussion of the psychology of drawing to the above works.

---

* Throughout this study, numbers in parentheses, such as this, refer the reader to the bibliography, where references are listed serially.

From the first scribbling of the babe at about one year of age and for a considerable number of years thereafter, drawing is a pleasurable occupation and an increasingly satisfactory medium of expression. Among a few gifted individuals it may persist as recreation, avocation, or profession; but a growing self-criticism brings increasing awareness of the shortcomings of the individual's techniques for representing the realities about him, and there comes a time somewhere between 10 and 14 years of age, when in many children a regression in drawing ability sets in. Burt (7) ascribes it to emotional rather than intellectual causation, and treats it as a matter of repression.

Drawing begins in the toddler stage, or earlier, with random movement of the pencil. But there comes a time when the small child, hitherto content with the purely ideomuscular occupation of scribbling, first in mass and later in scattered and more coordinate manner, ascribes to some particular scribble a name—more than likely the name of some person in his immediate life-environment. A little later a still more significant act takes place. He announces his intention to draw something; and then he produces, with complete satisfaction, a scribble which to the adult eye may be indistinguishable from any of his previous scribbles. But he has none the less achieved a drawing as fully purposive as though he had reached the level of representative art.

From this time, until a quite advanced level of graphic ability has been reached, there can be noticed very definite levels differentiating the drawings of children. Experiment extending by now over a period of more than 40 years has led to the conclusion that the drawing act is in some way an expression of human mental development.

Such levels are demonstrable both from a quantitative-objective analysis and from a qualitative-subjective point of view. For instance, Maitland (35), Katzaroff (28), Baumgarten (3), and others have noticed that the choice of subject in spontaneous drawing differs with age (and they agree rather well as to their findings). The human form is the subject most frequently chosen by young children; pets, familiar objects, and landscapes gradually supplant it as the child grows older. Thomson, however (52), points out that the *interest* in the human form as a subject for drawing has probably not diminished, but that the felt difficulty in its representation is so much increased that it is *shunned* as a subject rather than *supplanted.* In substantiation of this view, she finds that children frequently draw other subjects, with humans as a part of the composition. One might venture the additional thought that the human form as a subject for drawing is given a more fitting emphasis; it no longer holds the entire stage, but appears rather as just a part of the world surrounding the child.

Another qualitative differentiation of children's drawings may be made with respect to the portrayal of motion. Ayer (1) quotes from Rouma to show four stages; and Eng corroborates the existence of those stages in her work. The very first drawings lack motion completely; the child has no thought of it. They are followed by pictures just as completely stereotyped—*i.e.*, conventional and stiff—as the first, but the child will tell verbally or by gesture that the object is moving. Next there comes a stage which Rouma calls Indication by Relationship, and Eng more literally designates as Motion Indicated by Connection: the figure is still perfectly conventional, but an arm may be drawn as a long line over to the tree to show that the boy is picking apples; or a line from a stereotyped dog to a stereotyped house indicates that the dog is going to the house. The third stage (Incomplete Motion, or Motion Incompletely Indicated) shows most of the figure still stereotyped, but some part of it will show motion: the foot may be raised, or even the whole leg, so that we may see that "the man is walking" or "running." Finally there comes the drawing in which there is an endeavor to show in posture and position of parts, motion in the entire drawing.

Another qualitative form of progress is to be seen in the evolution of line from scribble, and of form from line. Thomson (52) points out the growing clearness of perception in the child as he grows older; she finds with increased age an increasing tendency to perceive background and appropriate color placement, an increasing tendency to perceive the specific rather than the general, and an increasing tendency toward accuracy in the representation of details.

Quantitatively there are differences in the number and character of details, such as parts of the body and of clothing, and differences in relative proportions of the various details attempted.

Most of the studies of children's drawings seem to have been confined to a descriptive treatment of the material, for there have been such varied motives behind the studies as revision of curricula, determination of children's interests, exploration for techniques differentiating abnormal mental states one from another and from the normal, comparing primitive and prehistoric art with children's. A considerable number, however, have attempted some degree of evaluation of drawings, in order to arrive at some understanding of the relationship of drawing ability to mental development, or, as in Ayer's work (1) to evaluate various methods of instruction. But here again there has been a lack of quantitative analysis. Burt (7), Thorndike (53), McCarty (36), using the human form as the subject for the picture, have erected more or less elaborate scales of drawing achievement or skill, based on qualitative rather than quantitative judgments, from the application of which there has been demonstrated a relationship between drawing ability and scholastic achievement and intelligence. And Bird (4), using a 7-point scale applied to some 3000 drawings of a cat running after a ball demonstrates the fact that intelligence is one of the factors necessary for ability to draw, in the case of children from the first to the ninth grade.

By far the most ambitious undertaking in the objective and quantitative evaluation of children's drawings is that of Florence L. Goodenough, reported in detail in a 1926 publication (23). It involved a study of thousands of drawings obtained from public-school children representing all types of economic, cultural, and racial backgrounds. From that mass of data she worked out a point scale practically freed from subjective judgment. In this scale, if a point does not depend on the easily determined absence or presence of a particular detail, then it is usually a matter of simple measurement with a millimeter rule. Scores derived by means of her scale are to a surprising degree independent of art training or talent; they are repeatable from one judge to another with nearly the accuracy of agreement to be found in the Stanford-Binet examination; they are repeatable from one drawing to another by the same child with reliabilities as good as in the case of many accepted verbal tests of general intelligence; and they reveal an average correlation of .76 between drawing ability and Stanford-Binet mental age for chronological ages 4 to 12 years, taken separately, with a probable error of estimate of IQ in the neighborhood of 5.4 points at all ages from 5 to 10 years.

Unfortunately, Goodenough's data are concerned chiefly with the ages below 10 years; her norms are inapplicable to 12-year-olds, and probably to 11-year-olds [Cohen (11) and Gitlitz (22)]. Nevertheless, her point scale has been made to show increasingly higher performance for groups of older subjects. Levy (32), Dyett

(16), Cohen (11), and Gitlitz (22) have demonstrated it for various age levels from 13 years to college age; but in each of these studies it is shown that there is need for revision of the scale in order to do full justice to the higher level drawings.

Oakley (39), in considering the problem of applying the drawing test to older children, suggests that there should be three scales for the judgment of drawings to cover the three age ranges from 2 to 6½ or 7 years, from 6½ or 7 years to 9½ or 10, and from 9½ or 10 years to 14 or 15. He says little that is specific with regard to these scales, but he does suggest that in the third (the highest) scale, particular attention should be paid to the treatment of hands and arms, of difficult articles of clothing, and of general proportions. He is aware of the fact that regression will be operative in this third age-range, but he answers that a ''coefficient of regression'' might be of value in studying adolescence. Finally, there is Bird's study above referred to, which indicates a relationship between drawing skill and increasing development in children up to the ninth grade—early ''teen'' age.

Thus far we have shown that there is some universal principle at work, causing the human child to express himself, among other ways, graphically, and causing him to acquire greater skill in that expression according as his experience of life becomes greater and as his intelligence grows. Before passing on to a consideration of the more intimate nature of the expression of personality through drawing, it may be well to pause for a few further generalized observations.

Dallinger (14) points to the succession of appearance of details in the drawings of a child as being in general the same as the order in which his self-consciousness reveals them to him. He may not portray such details contemporaneously with his first awareness of them, particularly in the matter of gross bodily detail, but the sequences are none the less strikingly similar, not only in the matter of ''head'' before ''feet,'' and both before ''neck,'' but also in the realm of social, intellectual, and emotional subjects.

Eng gives considerable attention, as do also numerous other authors, to the parallel between development in drawing and in conceptual thinking, as those developments show in the individual child. There is evolution of thought illustrated when a child at first calls any animate object ''da-da,'' but later differentiates between horse, dog, cat, etc., and much later recognizes particular *kinds* of dogs, birds, etc. There is a similar evolution from primitive "formula," "symbolic," or "schematized" drawings, wherein man, woman or child is set forth by the same stereotype, through intermediate steps, to efforts to set forth the actual details of specific persons or objects.

Drawing is not only an expression of general mental development, it is in its very nature an instrument for the expression of the most intimately personal characteristics. Were our techniques of interpretation only fine enough, we might be able to learn a great deal from a person's drawings, as also from his handwriting or from his free associations.

Such a study as Baumgarten's (3) seems obvious, perhaps, but it is an opening wedge in the matter of studying personality differences. She contrasted a representative group of drawings by Swiss children with a group by post-revolutionary Russian children. She found in the Swiss collection no reference to war; there were isolated bits of satire and frequent bits of humor and caricature; but the most common subjects had to do with the family or the environing country, with a fair representation of purely fantasy pictures from familiar fairy-tales, etc. The whole was to be characterized as *happy* and *peaceful.* The Russian collection, on the other hand, dealt quite commonly with political, military, or revolutionary subjects, while the to-be-expected pictures of "Mother," "Teacher," etc., were crowded in with pictures of invalids of one sort and another. She concluded that, as a means of exploring the child's mind and interests, spontaneous drawings are worthy of the highest consideration.

Stern, in his *Psychology of Early Childhood,* takes the following from the work of Krötsch, who found the drawings of a 6-year-old girl to be arrested for a whole year at the level of primitive schema. " . . . all the sheets, from first to last, show an exceedingly confused, aimless formation and arrangement. The child makes ten or twenty attempts before it accomplishes a figure, often scribbling over the paper with wild spiral lines, hundreds of dots, or short, meaningless strokes. The different parts seldom show any intentional meaning, and this when present is never carried out consistently. As a rule, the strokes are bold and decided, without many breaks, and showing no abnormalities as strokes. 'When I saw these productions [says Krötsch], they gave me the idea of a confused, erratic, unrestrained imagination, of a weak-willed, and yet in many respects a determined child, wanting in self-control. There was scarcely ever any sign that the child had a feeling of any standard, or any limitation of what was allowed. She is continually showing degeneracy in some point or other, is of a restless, excitable, nervous temperament. This activity—or rather restlessness—may be partly of a physical, partly of a psychic nature.' '' The analysis just given was made from the drawings alone; Krötsch had never seen the child. But the girl's teacher considered the characterization to be quite fitting.

Kugaenko (29), Mohr (37), Prinzhorn (42), Goodenough (23), and others, working with the drawings of insane or psychopathic find considerable departure from the normal. Mohr finds that spontaneous drawings of the insane reveal dissociation in the ideational life, dissociation between ideation and affect, sexual arousal with very often an association between sex and cruelty, or sex and over-religiosity, etc. An example which he gives from a manic-depressive just entering the depressed phase shows a great cluttering of ideas, though with good coordination and detail exhibited in the portrayal of the separate items. The central figure of the composition is a woman weeping at a grave—giving a manifestly depressed tone to the whole. Goodenough's work tends to support the idea that a great mass of more or less irrelevant detail is indicative of a psychopathic personality. Prinzhorn's work (42), though more extensive than Mohr's, is substantially of the same character and comes to very similar conclusions in general. Kugaenko reports finding differences between various psychopathic states portrayed in spontaneous drawings. He mentions schizophrenia and manic-depression among others, reporting further that bettering of the psychic condition improves the drawing, and that a lowering of the drawing performance is indicative of coming relapse.

A second piece of work by Prinzhorn (41) dealing with the spontaneous art of prisoners shows their creations to be quite revealing. ''The pictures of prisoners,'' he says, ''give us a most arresting insight into the inner life of the criminal, and in this material there is mirrored in many ways the *milieu* of the prison and the gloomy turbulence of its inmates—a mirroring so clear that this investigation is fully justified. But what they disclose of the cultural personality goes back to the wide province of folk art without any single characteristic which will allow of a delimiting differentiation between them.'' The difference which he finds is a matter of quality of subject, not quality of drawing. Again, he says: ''If the prisoner occupies himself with a strictly realistic representation of his environment, . . . trying merely to set it down pictorially, one can say one thing with surety: He has arrived at an objectivity possible only after his personal problems and needs—the inevitable obtrusive restraint of his surroundings—have been internally conquered and laid at rest. Without such complete conquering one cannot win over to realistic objectivity; it is not sufficient that there be a (rebellious) adjustment behind prison walls, or that there be a penitent bowing to Morality, Law, or Power of State, or even that there be a patient resignation to fate.'' More specifically with regard to the subjects chosen by prisoners, he reports their chief characteristic to be a narrowly egocentric delimitation: First in importance are purely autobiographical materials, sometimes quite frankly set forth, often very symbolically or schematically represented: such subjects as home love, penal offenses, and struggles with social institutions are the most important of such material. Second in importance are the compositions setting forth various aspects of the prison *milieu.*

Although Prinzhorn finds nothing in the prisoners' pictures themselves to differentiate them from the normal, it is noteworthy that the content of the pictures makes of them a homogeneous grouping. And also, it is to be noticed that Prinzhorn contents himself with an examination of only those works which were done of the prisoners' own initiative. There is no exploration of the drawing ability of a representative cross-section of a prison population. There is a study by Ivanoff (27), however, indicating a fairly strong relationship among public school children between disobedience and low drawing ability, as also between low drawing and such other undesirable traits as slovenliness and distractibility. Good intelligence and industry he finds to be related to good ability in drawing. His study has the two drawbacks of depending on subjective-qualitative judgment of the drawings (although he attempted to control his conditions), and of being interpreted by rather crude statistical measures. These two objections cannot well be urged in the case of Egger's study of the Goodenough Test among delinquent women (18). Using Goodenough's objective scale for scoring, she finds the delinquents as a group to be inferior to what others find to be the performance level of non-delinquents of like mental age.

This raises the question: Upon what does drawing ability depend? Or, differently put: What does a drawing ability commensurate with the individual's age indicate with regard to his general development? We have already seen that a large factor in the young child's drawing ability is intelligence; but Oakley very pertinently points out that a correlation varying between .5 and .6, as do most of the reported coefficients, leaves much unanswered as to what *else* is being measured.

Lawlor (30), working with Furfey's Developmental Age Scale in feebleminded subjects, reports a correlation of .70 between that scale and the Goodenough. The Furfey Scale is an attempt to measure maturity of interests, recreation, reading, etc.—what might be termed the maturity level of a boy's spontaneous occupations. The scale is quite devoid of relationship with general intelligence and it does correlate well with age-level, thus suggesting a performance of the task set for it by its author. From a relationship of middling value (such as is represented by correlations of .50 to .70) to both Furfey and General Intelligence, it might be inferred that the Goodenough Drawing Test has something to do with maturity in the child, but such low correlations still leave unanswered the question of *just* what type of maturity is being measured.

CHAPTER II

THE PROBLEM IN ITS IMMEDIATE SETTING

We have seen that drawings may profitably be utilized in the study of personality; they reveal not only the growing sharpness of the child's intellectual and perceptual life, but also something of such non-intellectual characteristics as interests or mental and social conflict. Such traits as neatness, industry and obedience (27) seem to bear a relationship to drawing, while such traits as decision *vs.* indecision, shyness *vs.* boldness (31), femininity *vs.* masculinity (23) (16) make for characteristic differences in the final product. Definite and characteristic differences both in intellectual and emotional development of the deaf and dumb (33) (49) as opposed to those of normal sensory endowment, and of various psychopathic personalities as opposed to the sane (17) (23) (37) (42) have been revealed in drawings. Although prisoners' drawings cannot be singled out from the products of a normal population, they have been shown to be charged with personal reference and significance (41) of a sort which could be particularly helpful to a psychiatrist. It is claimed (48) that the tapping of the ''kinaesthetic forms of thought'' through a technique of drawing with eyes open and then with eyes shut gives us material of diagnostic value.

The techniques in the various studies above referred to differ one from another, but in general the individual drawer has been allowed the greatest possible degree of freedom in choice of subject to draw, of composition and general character of the picture, and in the time consumed by the drawing task. Necessarily then, because of the freedom and consequent diversity of choice, the treatment of the results has been largely restricted to description. Quantitative measures, when they have been used at all, have rarely passed beyond the ratios and proportions expressing the occurrence of phenomena subjectively judged.

A greater objectivity in the handling of test material makes possible a greater amount of evaluative comparison between the performances of different groups, and the comparing of one individual's performance-level in one type of test with his level in another. But in return for these gains, something must be given up; there must be sufficient standardization in the administration of the test to reduce the variety of product; freedom of action is curtailed, and the final product is less expressive of the total personality.

It is the Goodenough ''Drawing of a Man Test'' which is the subject of this investigation, a test standardized for difficulty of task. And so the reader must be prepared to find a differentiation dealing more largely with ability than with personality—a differentiation in *scores* rather than in *qualities*. That such a difference could be demonstrated was suggested by Miss Egger's study (18), in which she showed for a group of delinquent girls an average retardation of Goodenough score indicative of several years lag for drawing behind the general intelligence. This conclusion was based on norms derived from Goodenough's work, then in use at the NYCCH, but since proved to have been too high (though not sufficiently too high to wipe out the inferiority in the delinquents' drawings).

Subsequent work, exploring high school (32) and college (16) levels of performance gives reason to suppose that Goodenough's method is applicable to the older children, but demonstrates quite forcibly the fact that her point scale is not developed to the point of adequately differentiating the higher level drawings. As a group, the High School performs at a level above Goodenough's best group, and as a group the College surpasses the High School. But there is great overlapping in both instances. Finally, since the present study was undertaken there have been two extensive applications of the drawing to 13- (11) and 14-year-olds (22), demonstrating the applicability of the test task to such age levels together with the inability of the scoring scale to bring out the full superiority of the drawings of those older children.

In the hope, then, that the instruction to draw ''any kind of man'' in ''any way he pleased'' so long as he ''did his best'' would still leave to each child a fair degree of freedom of action, and that the demonstration of an inferiority of performance among delinquents might shed some added light upon the perplexing problem which they present to us, and, further, in the general conviction that there is need for greater interest in drawings as an avenue of approach to the understanding of the individual, the following problem was formulated.

It was proposed to investigate a difference or unevenness in mental development as indicated by the use of two tests. That difference is the interval between the mental level as given by a test of general intelligence and that given by the Goodenough Drawing

Test. The investigation has to do with the relationship of that difference to delinquency. What it comes to in the study as finally set up is a measurement of the drawing ability of the delinquent group in comparison with various control groups, holding general intelligence constant. The variable of sex was ruled out by limiting the study to boys. It was proposed to study the Goodenough Test in relation, not only to delinquency in general, but to various groupings of delinquent children according to ''original offense,'' to ''length of detention,'' and to ''parole success.'' Unfortunately, numbers were too small for this part of the experiment to be carried out.

A preliminary problem, for which a complete solution was not to be sought, but a problem fundamental to the above, and requiring further exploration before any final conclusions can be arrived at relative to the above, is the matter of a possible extension of Goodenough's scoring methods to the drawings of older children, so as to bring out more completely whatever adaptability there may be of the Scale to those older children.

Further, in an effort to answer, in part at least, the question of what, beside intelligence, is measured by the Goodenough Test, it was decided to include a test of maturity other than intellectual, and so the Furfey Scale of Developmental Age in Boys was incorporated into the testing battery.

SUMMARY GLIMPSE FORWARD TO THE FINDINGS

The findings and conclusions of this study fall under three headings:

1) Those which relate to the applicability of the drawing test to boys up to the ages of 15 to 18 years.
   - a) Using Goodenough's original scoring method.
   - b) Using an *Extension* of Goodenough's scoring method aimed at a better evaluation of high-level drawings.

2) Those which relate to *quantitative* differences between the various groups, derived from the use of Goodenough's method.

3) Those which relate to various *qualitative* differences between the drawings of the various groups.

Briefly, the study demonstrates:

1) That spontaneous drawing is a sufficiently powerful tool in personality analysis so that even applying the restrictions to spontaneity involved in giving the Goodenough Drawing Test, probably significant qualitative differences are shown to exist between experimental and control groups.

2) That those qualitative differences persist in the face of rigorous equation of groups on an intellectual basis.

3) That drawing performance is fully as reliable and shows as little variability among the older groups as among Goodenough's (younger) subjects.

4) That her scoring method can be extended to the higher level drawings, leaving the reliability undisturbed and leaving the score as completely independent of influence from artistic talent as for the unextended scale.

5) That the Goodenough scoring method restricts the evaluation to a capacity or ability basis, and that
   - a) The ability measured is not yet fully identified.
   - b) Interpretations in terms of this ability—*i.e.,* score differences—do not show up personality differences in full relief, but they do show a consistent tendency toward inferiority in behavior problem groups.

Of these findings, (2) and (4) are the unique contributions of this study.

Before going any further in the treatment of these findings, however, there must be a word of caution inserted. We shall speak often of ''delinquents'' or even ''the delinquent,'' in such manner that the uninitiated might think of him as a certain species of the human animal. Nothing could be more out of harmony with the trend of modern psychological and psychiatric opinion. An extended discussion of delinquency is not called for in this study, but it will be necessary to insert here a few remarks of a general nature about delinquency, lest the reader be unduly disappointed in the lack of definiteness in the results of this study.

For, when all is said and done our boys are not delinquent; rather it is their behavior which is delinquent. Human behavior is a balance between drive and inhibition. If the drive toward socialized conduct be strong, and the inhibitions of antisocial conduct be likewise strong, we have a socially desirable behavior product. At critical periods the outcome of conflict in the choice of a course of action is problematical—one individual may find his solution in crime, another may be permanently unbalanced (reduced to insanity), a third may emerge at a higher level of behavior and character formation than ever.

The factors contributing to one or another of those results are too complex for analysis; but it is here to be noted that undesirable behavior is the resultant of some set of forces in action. It is a symptom, not an entity. Stealing may trace to a diversity of causes, ranging from altruism to extreme selfishness; it may trace to causes ''outside'' the person, such as insane compulsions. Add to this the fact that not only may similar behavior trace to different causes in separate individuals, but that in the same individual each act has its own unique history. One may then appreciate the statement that ''The Delinquent'' does not exist as such; that his personality is developed from a perfectly normal start, and that he presents no trait not to be found qualitatively identical in his neighbor; it is the balance *between* traits which is disturbed.

The reader will bear in mind that boys of our (public school) control groups may have behavior patterns as undesirable as our ''delinquents,'' with the single difference that they have not been caught; he will remember also that imbalance in the personality does not at all necessarily lead to unsocial behavior; also that among ''out-and-out'' delinquents, causation is unutterably complex. If he does, he will wonder, not at the lack of clear cut differentiation between the groups, but rather that any differentiating trend at all should be demonstrable.

CHAPTER III

THE EXPERIMENT DESCRIBED

The study is limited to boys within the age-range (9 to 18 years) at the Connecticut School for [delinquent] Boys, from which institution was drawn the main experimental group. None was included whose IQ in a language test fell below 80; furthermore, since the IQ's of the delinquent boys were on the whole below 100, the control groups were selected from the only moderately intelligent members of the various school populations involved, in so far as this was possible.

There are two experimental groups. The main one was drawn at random from the alphabetical name file of the Connecticut School office, by selecting every third card. The names resulting from this drawing were then gone over again. Wherever it was found that a boy had been selected whose IQ by a language test fell below 80, or whose reported physical examination disclosed some gross neurological disorder, that name was rejected and the name following in alphabetical order was taken, unless that, also, had to be rejected, in which case the next succeeding name was investigated, and so on. In this manner there was made up an original list of 110 names. Of these some could not be examined and some had to be discarded for one reason or another. The final list contains 81 names.

A secondary experimental group was taken from the cases of the New York City Children's Hospital, an institution for feebleminded, and was divided into two: those cases showing histories of behavior disorder, and those cases showing good conduct. They were restricted to boys of the same C. A. range and roughly the same C. A. distribution as the delinquent group, and were further restricted to IQ above 50. No boy was accepted for this group who showed any physical history of epilepsy or convulsions, of any neurological pathology, or of any gross defect or disfiguring birthmark. By the time these restrictions had all been brought to bear, it was found that the complete files of the hospital's psychological clinic had been gone over. Taking into account the routine testing procedures at the clinic, and considering that the files were nearly exhausted, it is reasonable to assume a random selection.

There are three principal variables whose control has been sought in the selection of four principal control groups. It is quite conceivable, if the Goodenough Test score depends on maturity of the individual, that one might find considerable differences in moving from one socio-economic level to another; for children of one home will be thrust on their own resources while those of another home will still be sheltered, and, on the other hand, children of the latter home will probably be given more thorough training along social lines. If the Goodenough Score depends in large degree on intelligence, and such is demonstrably the case, it is important to control the matter of school maladjustment—an important item in the problem of the delinquent. Lastly if the Goodenough Score is affected by emotional development, it will be important to consider such influences on that development as would naturally be expected to arise out of broken home situations leading to neglect of children or institutionalization, or both, and also to influences arising out of exposure of the child, not only to such family disorders, but to neighborhood influences where delinquency flourishes.

It was felt that the control of those three variables: socio-economic level, school adjustment, and home-and-neighborhood influence could more expediently be secured by a number of control groups selected for that purpose, than by a formal testing procedure. Accordingly, there were four groups set up, and drawn, all of them from the language-IQ range 80 or above, all of them from the male sex, all of them from as nearly as possible the same age-range.

First it is necessary to demonstrate a difference between the delinquent group and a group whose behavior is quite acceptable to the courts. The most logical place to turn for this control is the public school, and the cooperation of three public schools was enlisted. The first was found in a residential suburb of the metropolitan area, of very desirable character, whose citizenry is made up for the most part of persons of "comfortable" circumstances. There are no "*poor*" sections, though there are such in the adjoining towns. The boys of this school, as a group, may be accepted as coming from as good home-background as can be obtained in any group picked simply on the basis of community standards. The delinquent group we shall refer to hereafter as the D-group and this public school group we shall call PS_{res} to distinguish it from the second and third public school groups to be described; the PS_{res} list contains 113 names.

The second group was selected to demonstrate that any difference found to exist between D and PS_{res} could or could not be explained by the difference in economic level. PS_{res} was drawn wholly from American born of American born parentage, where there could be no question of financial dependence. The D-group is made up largely of American born children of foreign born parentage—a typical second generation immigrant gathering in an industrial state. A "PS_{cong}" group was made up from a population not all of foreign parentage, although a great many names are obviously Italian, Czeck, Polish, etc.; but the group was carefully picked with reference to the parent's occupation. In the PS_{res} group the only requirements for inclusion were: (1) an age-grade placement starting with "9 years 6 months to 10 years 5 months, and in IV grade" and so for each succeeding year up to "17–6 to 18–5 and in XII grade"; (2) freedom from gross physical defect or neurological disorders. Within these limits, the boys were chosen in alphabetical order until the desired number for a given CA had been accepted. In the PS_{cong} there was an identical method of choosing, with the added requirement that the father's occupation should be small-tradesman, laborer, or the like. The distribution of these occupations is given in Table I.* This, together with the information that the school selected draws its pupils from the poorer homes and more congested districts of the city, was taken as sufficient indication that the D-group was approached as nearly as might be in a public high school setting. The number in this group is 55.

The third control group was taken from Public Trade School; a school which is for the most part made up of boys who have just as great a distaste for academic school work as the D-group, boys who have had all the temptations to "play hooky" and have had many of the school retardations of the D-group. But either they have possessed that quality necessary to adjust, to bide their time, and to keep from continued delinquent activity, or else they have had the luck to escape detection until they have succeeded in getting by the State Compulsory Education Laws into the haven of Trade School. This "PS_{trade}" group was made up as follows: From a knowledge of the proportionate enrollments of the various departments, there was made up a quota for each department to subscribe toward the total group. Each instructor was asked to select from his boys that number which was his quota, taking care to include none who was outstanding, either for brilliancy or stupidity, or for special aptitude in that department, and to avoid also any boy from an unusually good home and any boy with known physical defects. It was carefully explained, both to the instructors at the time of selection and to the boys at the time of testing, that the tests had nothing whatsoever to do with the school or the school work; that it was desired simply to get as accurate a cross-section of the Trade School population as was conveniently possible. Subsequent testing was required to eliminate the IQ's below 80. The number finally used in the PS_{trade} group is 65.

---

* All tables and diagrams will be found in Appendix.

Lastly, there was a group ("S.H.") from a State home for dependent and neglected children. The ages in this group did not run so high as in the D-group, and the intelligence is slightly better, but the two groups are quite closely comparable in home and community background and in the matter of foreign parentage. The chief difference is that the S.H. group has not been judged "delinquent" by the courts.

Finally it was felt that a method of matched individuals might profitably be employed, and so a list of cases was selected from each of the four groups, PS_{res}, PS_{cong}, PS_{trade}, and S.H. in which each boy was within 4 months of the chronological age and mental age, respectively, and within 5 points of the IQ of a corresponding boy in the D-group. (M. A. and IQ determined by a language test.) The final lists contain 20 pairs with PS_{cong} for control, 26 pairs with PS_{trade}, 31 pairs with PS_{res}, and 26 pairs with S.H.

All of the groups were given a language test of general intelligence; it had been the original plan also to give to all boys a non-language test of intelligence, but it was impossible in the case of the PS_{res} and the S.H. groups for the institutions to find time for this test. All of the groups, except S.H., were given a test for Developmental Age—a test designed to bring out degree of maturity in interests, ambitions, and recreation. Every boy was given the Goodenough Drawing Test. Finally there were some notations of a personal sort in the case of almost all of the boys; in the D and S.H. groups there were more or less extensive case histories; in the PS_{cong} and PS_{trade} groups there were office records and teachers' comments. In the PS_{res} group there are a few isolated teachers' comments.

The Pintner Non-Language Test of Mental Ability was used wherever there was any test of non-verbal intelligence given. The Developmental Age Scale for Boys, Form B–3 as devised and revised by Paul H. Furfey (20) was used in all cases as the test of developmental age.

The language scales for the measurement of intelligence were rather numerous. In the first place, wherever there was a record of a Stanford-Binet examination given under conditions and by an examiner known to and approved by the author, that record was acceptable for this study. In the cases of PS_{res} and PS_{cong} there were available the records of group tests given by the school systems for classification purposes, and these were accepted as sufficiently accurate for the purposes of this study. For the rest, there was an attempt to apply to each of the various groups a language test suitable to its age and mental age range.

In the final count, then, it was found that the Stanford-Binet, the Intermediate and Advanced forms of the Otis Self Administering Examination, the Illinois General Intelligence Test, the National Intelligence Test, form A, and the Terman Group Test had all been used, either alone or in various combinations.

Most of the testing was done in groups; either directly under the supervision of the author, or else as part of the regular routine of the institution concerned. All of the Goodenough Drawings, except those from NYCCH and a few from the SH group, were done under the direct supervision of the author; all of them, except a few in the D-group, were done in group tests, with usually 40 to 50 in a group, but sometimes as few as 10 to 15. All questions pertaining to tests were left to the author, except that, in the Goodenough Test, some of the commonest questions were anticipated, and the assistants trained in *exactly* how to answer. The testing program was carefully considered in the light of the abilities and fatigue characteristics of the group, and provision made either for separate sessions or for generous periods of relaxation or recreation. It was considered most desirable to eliminate all possibility of ''talking over of tests'' between those who had had and those who had not yet had the tests, within any one system. The rotation of tests and the intervals between groups were specially manipulated to reduce this to a minimum; further the cooperation of the boys in the matter of secrecy and fair play was enlisted by appealing to them as co-partners in a scientific experiment. There was a frank facing of the impossibility of standardizing procedure over the wide range of type and age of subject; effort was directed therefore toward securing a uniform subjective attitude of honest cooperation and effort. It was the feeling of the author that his attempt was successful.

Each group of boys was told at the start that the study was directed at the differences in ability, interests, etc., between boys from different sorts of communities and in different sorts of schools. It was found necessary, among the older boys, to caution them that some of the tasks might seem silly to them, or even beneath their dignity; but they were assured of the value of the study as a whole, and were urged to take the tasks seriously, albeit with a smile; to set down their honest preferences or to perform to the best of their several capacities, without any comparison or whisperings among themselves, so that, at the end, there might be information as to what they really would choose or what they really could do.

In the case of the Furfey Scale, one question was so frequently asked by the older boys that it came to be answered before letting them start, in the following manner: following the regular directions they were told that sometimes the choice would be between ''things to do,'' sometimes between ''things to see,'' etc., and that in considering any given pair, they were never to assume that either one of the items must represent the height of ambition or the thing most to be desired. Rather were they to approach the questions each with this attitude: ''If I were given a choice between just these two things, which would I take?''

In the giving of the drawing test to the older boys, a similar procedure was found necessary. Instead of Goodenough's formula was the following: ''In a moment I'm going to tell you what to do (next), but first I want to say that you are not to ask *any* questions or to make any comments aloud. If you have questions, hold up your hands and either Miss ———— or I will come directly to you; I think, though, that most of the questions that you may have will be answered before I finish speaking. You are to draw on these sheets of paper [previously distributed, and already inscribed with name and date] a man: a whole man: the best man you can draw: and you are to be sure you have him all there. You may draw him any way you like: you may make any kind of a man. But remember: a whole man, and the best you can do. It will not be easy to keep your eyes on your own work the whole time, but guard against copying—for yourself and others. You may make as many tries as you like, and I will choose the best one. But be sure to let me have all your attempts, because *you* certainly will not be able to tell which is really the best.''

In spite of the fullness of explanation, there were invariably individuals who wanted to know if they might draw ''profile'' or ''running figures'' or ''cowboys,'' etc.; if there must be clothes or if clothes must be omitted, etc., etc. The invariable reply was: ''Draw him just as you like'' or ''just as you think best'' or ''draw any kind of man, but make him the whole man.''

Whenever a boy signified discontent, or whenever he wished to abandon a project started, he was given the opportunity of a second or even third, fourth, or fifth trial. It was necessary, however, to guard against seeming to urge a new trial on an unwilling boy; and it was doubly important to avoid implied adverse criticism of the first attempt.

Scoring of the tests was done, either by the schools involved (in the case of intelligence scores taken from school records), or else: (1) by the author himself or (2) under his immediate supervision. All scoring was subjected to ''occasional check''—*e.g.,* every fifth paper from a batch might be gone over a second time; and all arithmetical computations in the scores were checked by an independent person. The drawings were all scored by the author, personally, and his scores checked by Dr. Louise E. Poull, of NYCCH, until he had demonstrated his ability to score consistently with her, within the limits of accuracy laid down by Goodenough. Thereafter, only debatable points were taken to Dr. Poull for individual settlement.

CHAPTER IV

FINDINGS RELATIVE TO THE TEST ITSELF—RELIABILITY, ETC.

First in a discussion of results of a testing program should come a defense of the test itself: a consideration of its statistical reliability, that is, its ability to measure whatever it does measure with a sufficient degree of accuracy so that in successive applications of the test to the same individual substantially similar results may be obtained; a consideration of its statistical validity, that is, the degree of correspondence between the measures as given by a test and the measures of those same individuals as established by an outside criterion; and a consideration of the age range for which the test is applicable.

A. Reliability

Goodenough (23) reports self-correlation between first-graders' scores in test and re-test on the following day of .937 ± .006. Using the "split-scale" method and correcting by means of the Spearman-Brown formula, she finds an average reliability of .77 for ages 5 to 10 years, taken separately. Finally following the argument that the greater the variability (scatter of scores) within a given age-range, the lower the reliability of the test, she has compared her data with the data obtained for the Stanford-Binet by G. M. Willson[*] and finds the drawing to be of the same order of variability as the S–B, with a coefficient of variation virtually constant for the ages 4 to 10.

J. Yeppson,[†] using feebleminded subjects of CA 9 to 18 years, MA 5 to 11 years, gave the test three times at four-day intervals, and found:

R for 1st *vs.* 2nd test: 0.89
" " 2nd " 3rd " : 0.91
" " 1st " 3rd " : 0.91

Individual variations "rarely exceeded one year."

In the present study, 17 cases in the S H group were found to have had a former test, scored by a different examiner, at intervals of from 6 months to 2½ years previously. They range in C A from 8½ to 14½ years, in MA from 7 to 18 years, in IQ from 80 to 120.

---

[*] *Journal of Educational Psychology.* 1925: *16*: 193–207.

[†] *Journal of Educational Psychology.* 1929: *20*: 448.

The rank-order self-correlation of the Goodenough IQ's is 0.65. A second group of 16, from the D-group over similar ranges, show rank-order self-correlation of IQ's of .79. In evaluating these low correlations, it is necessary to remember the small number of cases and their source—the very groups where we shall later see that one would expect to find the greatest variability.

A more significant indication of the reliability of the test in the present study is to be found in Table II. The numbers involved in the calculation of the various coefficients is shown in each case, and also the age-range. The calculation is based on a random sampling of the cases from each of the three groups, and follows the regular procedure for finding reliability by the split-scale method. The values tabulated include the correction to full-length scale by the Spearman-Brown formula:

$$r_x = \frac{Nr}{1 + (N - 1)r}$$

What they show is a fully acceptable reliability in the two public school groups, while the results for the D-group foreshadow what is later to be set forth a little more fully—namely, an increased variability among behavior problem cases. The slightly higher coefficients for "Limited Extension" and for "Revision" are not appreciably in excess of the expectation in view of the increased length of the scale:—a 14% and a 24% increase, respectively.

The extension of the Goodenough Scale is to be considered in some detail in the next chapter. For the present it will be sufficient to say that both "Limited Extension" and "Revision" refer to an effort to discover details significant in the scoring and differentiating of high-level drawings. The "Revised" scores include the full Goodenough Scale of 51 points, *plus* a certain number of new ones. The "Limited Extension" is merely a selection of the more significant extension points of the "Revision"; it still keeps the 51-point Goodenough Scale intact.

Applying the test of variability to the data from the three public schools we find that the S.D., which is a measure of the scatter of the scores of a distribution about the mean, compares very favorably with the S.D. calculated from data reported by Goodenough for ages 8 and 10 years. (See Table III.) Since the mean scores show no consistent behavior with increase of C. A. beyond 15 years, the data have been lumped for the four ages and the three schools to give a value of S.D. which is quite comparable with

Goodenough's total 8-year-old group as also with her normal 10-year-olds. (She distinguishes between her Accelerated, her Normal, and her Retarded groups at each age.)

The variability as found in the case of scoring by "Limited Extension" is somewhat greater in each case than is that for "Original" scores. This is to be expected, because the effect of the extension is to raise a number of the higher scores while it adds nothing to the lower ones; in other words, it introduces a greater spread into the score distribution by differentiating between drawings at the high end of the scale which would otherwise be grouped at the same level.

The conclusion to be drawn from these findings for reliability is that the drawing test remains reliable when given to children of the age-range studied in this paper, despite Goodenough's caution with regard to its application to children over 10 years.

B. What the Drawing Measures

Goodenough found a correlation of between .70 and .86 for drawing score *vs.* Stanford-Binet mental age, taking each calendar age from 4 to 10 years, inclusive, separately. The average value was .76. She found, furthermore, by partial correlation technique, that the drawing test "measures an aspect of mentality which is in some degree distinct from that measured by the Army Alpha or the Trabue Completion, and which is likely to be disregarded by teachers in their estimates of pupils' intelligence."

Poull and Clemens working with feebleminded subjects find a correlation with Stanford-Binet quite close to the one reported by Goodenough.* Earl, reporting on a group of 113 drawings from English feebleminded,** finds an r of .48 with Stanford-Binet. Yeppson† reports an r of .60 for 37 defective boys CA 9 to 18 years. Levy (32), Cohen (11), Gitlitz (22), using a variety of subjects, all older than Goodenough's, and from the normal population, report r's of .35 to .40. Eggers, using delinquent girls (18), reports an r of .37. Dyett (16), with subjects of college age, reports "no correlation."

The findings in this study, shown in Table IV, agree with the greater number of these findings in reporting low correlations with

---

*H. Clemens. Unpublished MA, Columbia, 1930. *Validity of the Goodenough Drawing Scale as a Clinical Measure.*

** *Journal of Mental Science,* April, 1933.

† *Loc. cit.*

tests of intelligence. But it must be added that improvements in scoring the higher level drawings may well raise the correlation to some value nearer the one reported by Goodenough.

In translating the statistical language of correlation into English one might adapt a discussion by Rosanow (46) of a coefficient of correlation of .66 and say that one or more other factors taken singly may be more important than intelligence in determining the Goodenough score. Or, evaluating the reported coefficients by Kelley's ''coefficient of alienation'' it may be said that if one estimates a child's Stanford-Binet M A from his drawing score, relying upon Goodenough's r of .76 between score and M A, the Goodenough score gives him only a 35% advantage over pure guesswork —he is still far short of *half-way* to the goal of perfect accuracy of estimate. When it comes to the lower values of r (.50 and less), it may be said that, although there is a positive relationship rather than none at all, ''Intelligence'' as measured by the Stanford-Binet cannot be the principal determinant of the drawing score.

Our meaning will be clearer after drawing a parallel from a wider field of measurements. In surveying a personality, we must take account of various aspects—we must approach from various angles, such as the emotional, the attitudinal, the intellectual, to mention only three. Just as personality is complex, so the intellectual aspect of personality is itself a complex, which may be approached from different aspects. If two tests correlate highly with one another, it is because they are measuring either the same aspect or aspects each dependent on some common factor. When we find two tests of ability with lower correlation, we may conclude (granted each is a ''reliable'' measure) that they are measuring factors with less and less overlapping as r falls off. And so we say the Goodenough Test is gauging largely a different aspect of ability than is the Stanford-Binet or other similarly accepted test of verbal intelligence.

The first thing which will occur to the reader is that drawing ability or ''artistic talent'' would have a great deal to do with it. But Goodenough, in carefully controlled experiments, showed that not only did her scoring technique show its independence of such talent, even actual coaching of first grade children in the drawing of the human form gave them a negligible advantage over uncoached children at the end of a week after the coaching. It is also significant that a child will frequently revert to drawing of a level typical for his age if a person other than the one coaching him asks for a drawing, despite the fact that he may immediately after score several points higher for the coach!

Dyett's study of college drawings (16) rules out artistic merit as a significant influence on the drawing scores of his subjects. Diagrams 1 and 2 of this study illustrate the lack of such relationship for two of the control groups in this work.

It still remains true, of course, that a child must have some degree of ability in wielding a pencil in order to score at all; but capacity for analytical observation together with memory for detail and a lively autocritical attitude are of undoubtedly greater importance than artistic talent in earning a high score. Another influence, operative in the age range of this study and tending to lower the score, is the self-consciousness and emotional inhibition arising out of the subject's realization of the shortcomings of his drawing in conveying his notion of a man. His technique is inadequate to his ambitions. This phenomenon has been reported by many observers, but Burt (7) gives perhaps as clear a statement and interpretation as any.

It would seem, however, from the small size of our S.D. that the influence of this factor cannot be so great as previous students have supposed. It is probable that the emotional reaction of the boy when he receives the test task is a by-product of something more fundamental to drawing success,—something not yet clearly defined. Be that as it may, it was the author's experience with all of his groups, save only the IV, V and VI grade groups, that it was the exceptional boy who would start right in on the drawing task; it was the rule to have to say to the whole group, in answer to the invariable storm of protest: "I know you cannot draw, most of you. I knew you'd say it before I came here. But I'm not looking for pictures to hang in a gallery. If I'd wanted a collection of that sort I'd have gone to an art class. What I want is simply to find out how *boys* draw; I'm simply comparing what boys from different schools and from different grades can do. You will want the ——— School to show up well in the comparison. Now there isn't one of you who simply can't draw at all. Go ahead, then, and let's see what this group of boys *can* do." There would follow a number of raised hands, indicating questions of all sorts:—Can I draw him sitting? Can I make him loading an airplane? Can I draw him sideways? At the same time, most of the group would start in, after an exchange of glances, while a few would simply sit.

These latter would require more urging of the same sort as given above. Three boys out of the delinquent groups remained obdurate; they would not put pencil to paper. None of the control boys refused so flatly as that, but two in PS_{res} high schools, one in PS_{cong}, and two in PS_{trade} required an extreme amount of urging, while six of the delinquents needed it. None of these boys reaches the mean of his group in performance, while most of them fall in the neighborhood of the first quartile or below. Furthermore, the drawing in all but two of those cases has markedly infantile traits, and may be actually incongruous in character. (Incongruity of the drawings is a matter to be dealt with in Chapter VII. Briefly, it refers to a drawing not typical of any single performance level—a drawing internally inconsistent in some manner suggestive of imbalance in the subject. This is more fully discussed later.)

The point here to be brought out is this: If on the whole the performance of the older boys is superior to the younger, and if the variability of the older groups is not considerably larger than in the case of the younger, and if the whole group has shown itself diffident of the task but then has for the most part been willing to go ahead, may not the performance of the few indicate a lack of something which most of the group possess? The boy himself recognizes it only as an inability to do anything adequate in the line of graphic representation; but, with all his critical attitude toward his drawing, he is apparently unable to *see* wherein his drawing is infantile. He does not analyze his subject. He has performed on an immature level. The significant fact is not that he draws poorly and is painfully aware of it; nearly all boys share that emotional reaction with him. It is rather that he is unable to perform up to age on a scale devised specifically to avoid giving credit for special ability with a pencil,—on a scale wherein credit is given for the ideas a child *attempts* rather than for the excellence with which they are expressed; a scale wherein success consists in the indication of a thought rather than the skill with which it is portrayed. And if the *thought* is so notably absent from the boy's mind that he cannot detect its absence from the paper even under the spur of his active self-criticism, is that not quite possibly a fact as pregnant with meaning as that another individual of equal age, this time perhaps feebleminded, turns in another drawing of infantile level, but with complacency or even pride of achievement?

The alternative to such an argument would be to hold that the drawing is indicative of nothing at all beyond itself—a case of special ability. Such a contention seems untenable in the light of the accumulated studies of children's drawings and the definite manner in which they develop from one level to another in the matter of detail, of proportion, of motion and its portrayal, and perhaps also in character of subject. If, however, this can be explained away, the believers in Special Ability will still have to explain Goodenough's finding that there is a striking lack of young genius in the field of painting and drawing. She concludes, for instance, from a study of one child artist's drawings: "In spite of the really remarkable artistic qualities of these early drawings, the immaturity of thought was very evident. In only a few of the drawings in the first group was the nose shown, and ears did not appear until ten or eleven [years of age]." Furthermore, a search of biographical material in Champlin's "Cyclopedia of Painters and Paintings" and in his "Cyclopedia of Music and Musicians" revealed that very few artists showed unusual ability in drawing before the age of 12 or 13, while a "fair percentage of the musicians had not only shown unmistakable talent but had won some fame by that time." Goodenough herself reports failure, in spite of careful search over a period of several years, to locate "a single child under the age of 12 years whose drawings appeared to possess artistic merit of a degree at all comparable to the musical genius occasionally shown by children of this age."

We conclude that drawings are indicators of some sort of maturity or development, and in the hope of throwing light on the nature of that maturity, the Furfey Scale for Developmental Age in Boys was incorporated in the testing battery. Lawlor, working with an early edition of the Furfey scale, in a study of D.A. in feebleminded boys (30) found an r of .70 with drawings, while the r's with other intelligence tests ranged from –.04 for Porteus Maze to +.35 for Stanford-Binet.

Developmental Age, as Furfey defines it (20), is "the progressively increasing and non-intellectual maturity of general behavior which shows itself in the growing child's play-preferences, in his fantasy life, in his choice of books and movies, in his ambitions, and, in general, in his whole behavior type." When C.A. is partialled out, the correlation of his test scores with mental age is practically negligible, while they are pretty well correlated with calendar age and with pubescent development, and represent, therefore, a distinct type of maturity: one which is behavioral rather than intellectual. It was felt that the r of .70 reported for the small number of feebleminded in Lawlor's study was worth further investigation.

In table IV there are reported the correlations between Drawing and Furfey scores as found for the PS_{res} and for the D-group. In both cases the coefficient is positive, and 4 times its PE, or better; the relationship is therefore probably a real one. But a coefficient of .40 is low; it can serve only to show that the Goodenough test gauges in part, at least, a maturity other than general intelligence, a maturity which has been found negligibly correlated with Stanford-Binet M.A. except as both are related to C.A. Again it must be added, however, that improvement in the scoring of drawings of older children may reasonably be expected to raise the value of the coefficient; but whether or not it can be raised to such a value that the drawing and the Furfey test can be considered alternates, is a question which cannot here be answered.

Table IV shows all correlations found in this study. It will be seen that the drawing is positively related to general intelligence as measured by either verbal or non-verbal tests. It is further interesting to see that it is better related to test IV of the non-language battery (picture completion) than to any of the others of the P.N.L., and apparently much better related to this paper-and-pencil test of picture completion than to the Healy P.C. II (r taken from a previous study). In part, this closer relationship may consist in the likeness of materials, but of greater importance, probably, is the fact that in the Pintner subtest the task is one of criticizing a drawing which lacks some more or less vital detail, while in the Healy test the task is an analysis of a situation and a search for a solution to the missing element; and not merely for *a* solution, but for a *best* solution.

The principal conclusion to be drawn from this section is that, although we have found a number of moderate and weak positive correlations, we have not yet found just what it is that is being measured by the Goodenough score.

C. NORMS AND AGE-LEVELS

Goodenough gives "tentative norms" for 11, 12 and 13 year levels, but she points out that, using these norms, the IQ for a normal sampling of 11- and 12-year-olds falls off to 84. It is her conclusion from this that there is indicated the breakdown of the method.

But that is not the necessary conclusion; it may be merely the breakdown of her Scale. Goodenough's norms for the 11-, 12-, and 13-year-levels are derived from a curve "smoothed and extrapolated at both ends." The work of Cohen, Gitlitz, Levy, and the author indicates the fallacy in her procedure; the growth curve for drawings, instead of continuing as for the younger children, flattens out after the age of 10 years when Goodenough's scale is used as the gauge. There is improvement beyond, but the rate is markedly less. The indication now would seem to be that the application of the Goodenough *scale* beyond the 10-year-level is uncertain. But the *method* would seem to be capable of extension, certainly beyond this point, and possibly well up into the "teens"; for added scoring points studied in this experiment have shown their power to differentiate the higher levels of drawing performance. This carries us directly to the next chapter.

D. SUMMARY

1. The drawing scale, applied to "normal" children above 10 years of age shows a statistical reliability in the neighborhood of .88 to .90 as calculated by the split scale method and Spearman-Brown correction formula—a reliability fully as high as Goodenough was able to demonstrate for her younger children.
2. The variability of the drawing scale at the higher age level is quite comparable to the values reported by Goodenough for 8- and 10-year-olds.
3. The relationship between drawing success and intellectual level may be less close for normal children over 10 years than for those below that age, as reported by Goodenough; and somewhat less than for feebleminded subjects of like age, as reported by Earl and others. On the other hand, it may be that the crudity of evaluation of the high-level drawings is the reason for the small r's at these ages.
4. The relationship between drawing success and various non-linguistic factors of general intelligence is even less on the average than for the linguistic.
5. There is a weak, positive relation between the drawing level and maturity of the sort measured by Furfey's Developmental Age Scale for Boys, but it is a relation statistically perfectly reliable.
6. There is reason to believe that drawing level is an indicator of some type of maturity or developmental level, as yet not exactly identified.
7. The Goodenough drawing scale in its present state is incapable of doing full justice to high level drawings.

CHAPTER V

LOOKING FORWARD TO AN EXTENSION OF THE GOODENOUGH SCALE

Fundamental to any investigation of drawings in an age-range principally above 14–6 (such as in the present study) is a demonstration that the drawing test is applicable to such ages. Dyett (16), Levy (32), Cohen (11), Gitlitz (22), have all collected drawings from subjects older than Goodenough's. All find that their groups, as *groups,* perform at a level higher than Goodenough reports for her normal 12-year-olds. On the other hand the differences in median scores are not nearly so great as inspectional evaluation of the collections would lead us to expect.

Acting on the suggestion therein contained, the author jointly with Dr. Poull, and aided by suggestions from Pignartelli, Cohen, and Gitlitz, drew up the twelve points listed at the end of this study, p. 76, which together compromise the Extension* of the original 51-point scale produced by Goodenough.

In general the points resulted from the felt unfairness in the application of the 51-point scale to the drawings of high school children. The derivation of any one of them will trace to one of three experiences, (or some combination of them) : (1) A difficulty-step in the original scale so great as properly to call for an intermediate step. (2) A good scoring method not carried to a high enough developmental level. (3) A bias in favor of some particular manner of representation: notably the profile in preference to the full face, warranted on the basis of Goodenough's material, but not on the basis of material from the higher age brackets.

An instance of the first type of revision is given in the evaluation of "Hair." Goodenough gives one point of credit for any kind of indication of hair from the most infantile types, through the scribble, to nearly perfect representation. An additional point is given if the drawing shows hair other than merely on the outline of the head, and does not allow the outline of the head to show through the hair. But there is a long range of conceptual merit between these two points; hence the items 8ax and 8ay of the Extension.

---

* In connection with each of the sample drawings in the appendix there is a note showing the scoring of these points. At the end (Figs. 42–56 inc.) is given a collection of details chosen particularly to illustrate the scoring of the extension points. These details are photographs of india-ink tracings taken from the original pencil drawings.

They do not require the perfection (rarely found) required for Goodenough's "8b" but they do require some concept of hair more mature than a mere scribble; it must be "formed" or "definitely outlined" or "indicated by shading" or in some other way it must indicate that the appearance of the hair is known, although it is not required that its fully non-transparent qualities be appreciated, nor is it required that it be distributed other than on the head's circumference. As a matter of fact, these points belong somewhere about the 9-year-level, for in practically all of the cases in the present study where hair is thought of at all, it will be found that 8ax or 8ay is earned. The other points, however, are for higher level drawings almost exclusively, that is to say, it is the drawing of the boy with greater age or the drawing of the greater scale-merit which is most likely to earn the Extension points.

An instance of the second type of revision is found in point 11ax; of the third type, in point 16dx.

In defense of the Extension as a whole and as a scheme, the author points (1) to the studies of Dyett, Levy, *et al.*, referred to above; (2) to the growth curves of the individual points (diagram 4) and the behavior of the "total addition by extension"* with age; (3) to the increase of the "total addition by extension" with increase in "Original" score, illustrating its selectivity for higher level drawings (diagrams 5, 6); (4) to the effect of the extension in spreading out the distributions of drawing scores at the high end (diagrams 5, 6).

For the sake of reference, Goodenough's points, briefly defined, are given on pp. 77–79, at the end of this study, immediately following the description of the Extension points, already referred to. As originally conceived and applied, this was a 12-point extension, but, on the basis of the growth curves given in diagram 4, alterations were made.

It was encouraging that, in spite of the generally poor form of the curves for the individual points, the curves for median and for mean additions should show so good a battery effect. Following up this beginning, it was determined to drop 14fx, 15bx, 16dx, and to combine 8ax and 8ay. 18bx, although very irregular in its growth curve, at least shows promise of sharp differentiation with age. The other points, considering the small number of cases, were considered to show curves of rather good form.

---

* Throughout the tables to be given in connection with Chapters VI and VII, there are references to two other scores besides the so-called "Original" or Goodenough score. This latter is the score according to the rules and scale developed by Florence L. Goodenough and described by her in "Measurement of Intelligence by Drawings" (23). The other two refer to the attempt to extend her scoring method to higher level drawings, reserved until this chapter for discussion.

In regard to 8ax–8ay, it had been the experience in scoring that any presumed difference in maturity value between "hair formed" and "hair shaded" is in practice arbitrary and that it is difficult in many cases to decide which is the point earned, even though it is quite certain that one of them *is* earned. The combined point shows a good growth curve, but the degree of maturity represented by this point is below the level of distinct usefulness in this study.

Data from the first work have been preserved in the tables and are given under the heading "Revised," or "Rev." or "Revision." Such scores refer to the 12-point addition. The 7-point addition which resulted from the revision of "Revised" is called the "Limited Extension" and abbreviated as "Lim. Ext." or "L. E."

It may be seen from all the tables given that the effect of the Limited Extension and of the Revision is to increase whatever differentiation in score may already exist in "Original" score, and that the reliability of that difference is greatest of all for the longer revision (with the single exception of the difference between Jr. H. S. and Sr. H. S. as given in Table VI). There is little to choose between them when it comes to increasing the reliability of the Goodenough scale, as calculated by the "split-scale" method (Table II). The variability as measured by the standard deviation increases from Original to Limited Extension and from that to Revision (Table V). And it should. For the desired effect is to raise the higher end of the distribution. It can be seen from the diagrams 5, 6, that there is a marked tendency for both revisions to do just that, and that Revision raises the high end by more than does the Limited Extension.

For all this evidence of "little to choose," there is undoubtedly greater safety in limiting oneself not only to those points which show a battery effect, but also to those which show some individual regard for regular growth—greater frequency of success at succeeding age-levels.

After the remarks in Chapter IV discrediting the relation between intelligence and drawing score, the reader may well wonder why all the growth curves for passing upon extension points are plotted in terms of MA. The empirical reason is that the curves thus found are smoother than the ones calculated for CA. The rationalization involved is that, in "normal" (public school) children, one will expect the various maturities to go fairly well hand in hand, and to find that superiority at one point will, in general, be matched with superiority at other points. But the use of the MA. is at best a makeshift. Succeeding studies dealing with larger number of cases, and with more normal distributions within each age than was here achieved, will have to be relied upon for the refinement in technique indicated.

There remains to demonstrate, for the points so far accepted, an independence of artistic ability such as Goodenough demonstrated for her 51-point scale. This has not been done except for the totality of addition by extension. Results for Revision and for Limited Extension in two public schools are graphically shown in diagrams 1 and 2; for ''Revision'' in two college groups, in diagram 3.

The two college groups are the ones studied by Dyett, and it was his cooperation that made possible the application of the ratings for artistic merit as given by his three judges in order to demonstrate the freedom of Revision from artistic influence at the college level—a freedom as great as for Original score. (For a full treatment of the method of scoring ''merit,'' the reader is referred to his study (16).

In the case of the public school groups, the author considered one artist's judgments sufficient, since those judgments agree with presumption based on former studies. The method was as follows: First, all drawings appealing to the artist as having ''any merit at all, even the least'' were selected from the total group, the effort being made to discard just as few as might be. The selected ones (36 from PS_{trade}, 31 from PS_{cong}) were then arranged in order of merit, and the number of points on Limited Extension (or Revision) earned by each, plotted as shown. ''Merit'' in this instance is defined not in terms of any classical art, but rather as the adequacy with which the boy has expressed what he had in mind. This obviated differences in total composition which might be felt irrelevant, and allowed of giving high credit to cartoons and bits of ''boy humor'' which would necessarily have failed had there been insistence on true ''artistic talent.''

While it is true that median scores for the drawings of zero merit are below the medians for those ''of sufficient merit to be ranked,'' and that the curve for PS_{cong} falls in a general sort of way from left to right, it is felt that the relation, if any, is slight. In the first place, although PS_{cong} shows less addition by extension and less total score for low merit than for high merit drawings, there are such irregularities throughout the "curve" that one would experience difficulty in convincing an audience of real relationship, were that his thesis. As for the medians of the drawings of zero merit, it may be said that drawings so utterly lacking in merit that no one of them can properly be said to be highest or lowest or middle, would naturally be expected to be found near the bottom of any scale depending on adequacy of conceptual representation.

In summary, then, of our findings with respect to an extension of the Goodenough scoring method, it has been shown:

(1) That ability of the sort measured by the 51-point scale increases beyond the limits of that scale.

(2) That it is possible to find points diagnostic of higher drawing levels; seven such, already located, show:

- (a) Selectivity for higher original Goodenough score with consequent increased spread at the upper end of the distribution of original scores.
- (b) Greater incidence among subjects of higher CA or MA.
- (c) Lack of bias for artistic ability.
- (d) No reduction in reliability of test scores.

And now, looking forward to further research in this field, the following might well be considered:

(1) In detailed criticism of the points hit upon in this study, one might say: (a) That, in scoring 9dx (the "clothing" point) there is still a great deal left to subjective judgment. If the point could be more closely defined as to number and character of details sufficient to indicate a mature concept of clothing, the greater objectivity might smooth the growth curve. (b) That there is need for more than the single point 18bx to restore the balance between profile and full face. Goodenough found justification for favoring the profile, but Dyett, Levy, Cohen, Gitlitz, and the author, all find that there is a strong return to the full face in higher level drawings. If the balance cannot otherwise be restored, it might be advisable to experiment with a point simply for full face, to be given where the total drawing score is above a certain level, or where the infantile type of full face is definitely absent. (c) That in spite of the disappointing results in the case of points 16dx and 15bx, something might yet be made of some modification of them.

(2) A few points tried by Goodenough, among them for instance the showing of teeth, were found to exhibit double curves; *i.e.,* an increase of passes up to a certain age, and then a decrease. Since a mature drawing is notable not only for the possession of

certain details but also for being above the showing of certain others (associated with lower developmental levels), it would not be unreasonable to experiment with a weighting system whereby credit could be given for the lack of characters definitely "infantile."

(3) Oakley has suggested (39) that there might well be different scales for different age ranges. There is much of value in this suggestion, though it entails the difficulty of the disposition of borderline cases—always a problem. As a first approach to this scheme, it might be well to experiment with weightings of points or combinations of points. Such has been rudely attempted in points 12x and 14x, with some experimental justification.

(4) Certain revisions need to be made in Goodenough's definitions, following the spirit of her rule for crediting "hands in pockets." For instance, certain head-gears cover all areas where hair would show, a wig may well cover the ears, etc. If the general level of the drawing clearly indicates a maturity above the level where such details are commonly passed, it is quite arbitrary to refuse credit.

(5) Finally, there is precedent for crediting qualitatively (see Goodenough's points 14a to 14f). It is altogether conceivable that motion-posture and characterization (see second chapter following) could be taken into account, along with other possible qualitative differences. For quality of concept is fully as striking an index of maturity as is quantity or completeness.

CHAPTER VI

DIFFERENCES BETWEEN GROUPS, DEPENDENT UPON DRAWING SCORES

I. Preliminary Section

The first finding of quantitative difference in drawing performance between comparable groups to be taken up is the one derived from the two feebleminded groups constituting the secondary experimental and control groups, because the picture they present can be quite compactly set forth, and because it is probably representative of the quantitative—*i.e.*, the *Score*—findings in this entire experiment.

It will be remembered that the subjects for both these groups were chosen at random from the files of the NYCCH, an institution for mental defectives, to fall within the age range of the larger study, and to have an IQ 50 or above, to include only boys, to exclude all cases of physical or neurological complication, of epilepsy, of psychosis, etc., and to be divided solely on the basis of the behavior notes appearing in the boys' folders—one group called Conduct Disorder, the other, Conduct O. K.

Scatter diagrams for both groups: Stanford-Binet IQ *vs.* IQ calculated from Goodenough Drawings, are given in diagram 7. A line drawn at 45° from "a" to "b" passes through those cells which would contain all cases if both tests measured exactly the same thing and did so with perfect accuracy. Lines parallel with this indicate the upper and lower limits of the area within which fall all cases wherein the IQ as calculated from the drawing is no further than ± 10 IQ points removed from that calculated from the Stanford-Binet test.

These lines are chosen to set off 3 areas—one in which the two tests are in essential agreement in their estimate of the individual's ability and the two in which the one test or the other leads the remaining one by a margin which may be expected to show a constant sign of difference. Goodenough gives as the PE_{est} of an IQ from the drawing scale ± 5.4 points; the PE_{est} for Stanford-Binet is commonly accepted as ± 5 points. As between the two tests, then, there is a "no man's land" of ± 10 points, and the total of variance about the 45° line must be the belt indicated—a belt 20 IQ points wide.

It will be seen that, whereas for 78% of the Conduct O. K. group both IQ's are within ± 10 points of each other, for the Conduct Disorder group the figure falls to 50% of correspondence. Of the remainder, 35% of the Disorder group have drawing performance more than 10 IQ points inferior to general intelligence, while only 5% of the O. K. group have such; and 15% of the O. K. group have drawing ability superior to their general mental level, while 14% of the Disorder group behave so.

By applying the formula: SD of a percent $= \sqrt{\frac{p \cdot q}{N}}$ where $p =$ the proportion found, $q = 1.00 - p$, and $N =$ the number of cases, and then finding the SD of the difference between two percents by the formula $SD_{diff} = \sqrt{SD_1^2 + SD_2^2}$ we find a $Diff/_{SD_{diff}}$ of 2.5 and 3.2 respectively between the proportions of the two groups falling (a) in the area ± 10 IQ points, and (b) more than 10 IQ points below the general intelligence level in drawing ability.

Considering now absolute units, we find, so far as variability is concerned, that the Disorder group is considerably more variable than the O. K. in drawing performance, in spite of the fact that the O. K. group is slightly more variable in general intelligence. So far as level is concerned, it will be seen that whereas the O. K. group is (insignificantly) higher in mean drawing ability than in general intelligence ($Diff/_{SD_{diff}} = 0.34$) the Disorder group is considerably inferior in drawing ($D/\sigma_{diff} = 0.996$). This latter figure is not conclusive* (it should be 3 times as great) for it represents statistically only 84 chances in 100 of a true difference in favor of Stanford-Binet; but it is perhaps noteworthy in connection with the other data of this chapter.

The two groups of boys here dealt with come from similar backgrounds and live in the same institution. The only difference, so far as such things can be controlled, is a difference in behavior. Yet in the one group, results for the two tests are quite in harmony; in the other, there is a strongly suggestive tendency for drawings to be inferior and more variable. It suggests a possibly interesting relationship between drawing ability and some personal factor or factors directly operative in behavior adjustment or maladjustment.*

---

* The reader will find several times in the following pages, figures which, by themselves, are statistically insignificant, but which tend to support one another in that they may be considered as revealing consistent tendencies. They are given with full consciousness of their individual weakness; and since "a chain can be no stronger than its weakest link," the author feels some diffidence in reporting them at all. And yet, is it not possible that there is suggestive value in a number of weak indicators acting independently and all pointing in the same general direction?

II. PRINCIPAL SECTION

The significant quantitative findings of the main study (relative to drawings) are presented in four sets of tables and charts: First there is table V showing the distributions of scores for the various groups of subjects, together with means and measures of variability. In section A, below, tables VIa and VIb give comparative data for the various entire groups and reliabilities of the differences found in drawing performance. In section B, there are table VII and its diagram, showing comparative data for the drawing test for various IQ levels in each of the groups of C. A. above 14–5. Finally in section C, there are presented in tables VIIIa, VIIIb, VIIIc and VIIId and the accompanying diagrams, the findings when the variables of CA, MA, and IQ are as carefully controlled as may be.

Table V may be dismissed as mere tabulation, after pointing out that the delinquent groups exhibit greater variability in drawing score than the control groups of comparable mean performance and age,† thus upholding the findings in the case of the NYCCH groups.

A. *Differences Between Total Groups*

Tables VIa and VIb give us our first opportunity to estimate the inferiority of the delinquents in drawing as compared to the control groups. These tables deal with the statistical ratio D/σ_{diff}, where D is the difference in mean performance between two groups and σ_{diff} is calculated from the standard deviations of the two distributions and is larger as the variability of the groups is greater. σ_{diff} is obtained from the σ_{dis} by the formulae $\sigma_{diff} = \sqrt{\sigma_{av_1}^2 + \sigma_{av_2}^2}$ and $\sigma_{av} = \sigma_{dis}/\sqrt{N}$.

Where an observed difference in mean ("average") performance is found to be 3 times as great as the σ of the difference between the groups, or greater, it is commonly accepted as statistically reliable—*i.e.,* in repeated samplings, although the magnitude of the difference may vary from one sampling to another, the sign of the difference will be expected never to change. It will be seen that most of the cases divide easily into the 3-or-better *vs.* the less-than-3 classes; but the figures at the top of table VIb (2.3, 2.6, 2.6) are not easily to be dismissed as insignificant; they represent a reliability of about 98.9%. That is to say, in only about 1% of samplings of older and younger delinquents would one expect to find the younger excelling the older.

---

* It would be interesting at this point to show a picture of this same sort for data contrasting the delinquent and control groups of this study, but, though the diagram is presented (diagram 8), and the analysis made as for the NYCCH groups, there will be no space given it in this discussion. The reason is the necessary inexactitude of the quotients for the drawing tests: there are no norms for performance beyond year 10, of sufficient value to be set up.

Cohen and Gitlitz report levels for 12- and 13-year-olds; those values together with levels as found in this study are the basis of the quotients given. They are the best available, but they are not truly tenable. For what it is worth, then, the diagram is given; at least it does not contradict the findings in the NYCCH groups, but rather tends to confirm them.

† The differences in variability herein referred to are among the statistically insignificant figures covered by footnote p. 44.

Let us look first at the differences which yield a ratio of 3 or more. They are the ones which show superiority of Junior High School over Grade-School children; Public School boys over delinquents for any school level except the elementary grades; and (with 98.9% reliability) older delinquents over younger. In other words, provided the groups selected in this study are really representative samples of the populations they are supposed to represent —and every effort was made to effect a ''random sampling''—we can be confident that there is a lower ability to depict a man in delinquent boys than in public school boys of like age, and a lower ability in grade school boys than in high school boys; and we can be virtually sure of the superiority of the older over the younger delinquents.

Further, we find that the younger delinquents perform (draw) exactly on a par with the grade children (the ''little boys'') of public school, despite the fact that they lead in age and in maturity of interests, and that they are under no handicap in mental development. That is, from table VIa it is to be seen that the younger delinquents average 2 years older chronologically and 2 years higher in Developmental Age, and that they average on a par in MA and are very nearly normal in the non-language intelligence test.

One might expect that the Junior High School with its lead in CA, MA and Furfey score would do better than the younger delinquents, but the Junior High School is reliably superior also to the older delinquents, although the delinquents are chronologically older and on a par with the Junior High School both in general intelligence and in Furfey age, which would be expected to give *them* whatever lead might be found.

In view of these reverses, it is not surprising to find the public school groups of CA over 14–5 (last four columns table VIa) leading the delinquents by such comfortable margins (see table VIb).

The reader may wonder why, when the author has used a multiplicity of control groups, he has used only one delinquent group, from which he seeks to draw generalizations. It is because the majority of studies of delinquents agree substantially as to results from one group to another for any given test. The expectancy, then, would be for general applicability of our findings. But by way of partial experimental answer to the objection of insufficient numbers, we evaluate Egger's finding (18) for delinquent girls of 13 to 18 years of age in like manner as for our boys. The mean CA of her group of 54 was 15 years, with MA 14 years (just lower than for our older group of boys), while her mean drawing score was 30.2. This mean score is lower than for our older D-group by a D/σ_{diff} of 0.52, which means practical equivalence of the groups for drawing. (In 30% of samplings the relative standing would be reversed in sign.) On the other hand, the ratios for D/σ_{diff} for superiority of our Junior High School, PS_{cong}, and Total PS over 14–5, over Egger's D-girls are 3.9, 3.4, and 4.3 respectively—all of them showing complete statistical reliability. This leaves a question as to possible sex differences; but it is Goodenough's experience with younger children and Dyett's with college age that the female leads, while Cohen and Gitlitz with 13 and 14 year levels find no significant difference. And whether the sex factor is important or no, these findings are interesting as suggesting distinct support of the thesis that delinquents draw at an inferior level.

B. *Differences Holding IQ Constant*

We come now to the first attempt in this study to hold IQ constant. (See table VII and its accompanying chart.) Subjects have been selected from each of the four groups according to IQ as determined by a language test, and the median drawing score found for each IQ level of each group, by both original and revised scoring. Since the numbers are so small, there is no attempt at formal statistical treatment, but it can be observed that for the older boys the median score seems to vary with the *group*—public school or delinquent—rather than with IQ. For it is to be seen that three of the four revised medians for the D-group are practically in a line, and that at the three levels where the three schools are represented, the progression is regularly from PS_{res} through PS_{cong} to D. Furthermore, it will be seen that, within each institution, the median scores jump up or down with little regard for IQ level.

C. *Differences Between Matched Groups*

As a further step in refining the equation of experimental and control groups, the so-called matched-comparison groups were made up, by selecting pairs of cases where CA and MA varied by no more than 4 months, respectively, from D to control, and where IQ was within 5 points. Summarizing in common sense language the influence of this procedure on the difference in drawing performance, one is forced to say: "The more nearly one makes the two groups alike, the less difference exists between drawing scores."

In respect to the three variables: IQ, MA, CA, the matched comparison groups are veritably identical, as can be seen from table VIIIa. In respect to numerical findings, the mean delinquent drawing performance is raised, the mean control is lowered, so that the difference diminishes. The numbers in the groups are so reduced as to render calculations involving SD's useless, but it is noteworthy that, although differences are reduced, they still exist, and are of like sign as when total groups are considered. Except in the case of D *vs.* SH, the delinquent is inferior.

As an estimate of the extent of difference still remaining after CA, MA and IQ are equated, we have the data of table VIIIa graphically presented in the accompanying chart, and the data of table VIIIb, which will be discussed below. From VIIIa we see that by all methods of scoring and for all groups the median control is superior to the median delinquent. The very slight difference in the case of SH we discuss below.

In table VIIIc are tabulated the data obtained by scaling from the ogive curves for the matched groups. It will be seen that the lead of the control group is fairly consistent in every case. Grouping the data, it can be said that to make the D and control curves coincide, the D group would have to be raised by 4 points of "Original" score or 5 points of score by "Limited Extension" at each of the key-points: the 10, 25, 50, 75, 90%-iles; or that the scores of the D boys at each of the key-positions: 0, 25, 50, 75, 100%-iles, would have to be raised to the level of the 15%-ile next above.

Since the numbers are small for these controlled comparisons, a pairing method has been resorted to, in order to bring out a little more forcibly the inferiority of the delinquent. It was said that the matched groups were made up by pairing a D boy and a control boy. In table VIIIb is given a summary comparison of each of the pairs of boys, taken separately, and in the accompanying diagram are shown the distributions of those differences. Data are given to illustrate the equivalence of CA and IQ; it will be fair to presume that MA would behave similarly to CA. It will be noted that the D-group is inferior in Furfey and Pintner Non-Language standing, as well as in drawing. A positive deviation is one showing a difference in favor of the control boy (greater age, higher score, etc.); a negative one shows the D boy to have the lead. The "total of the positive differences" is simply the sum of all the differences of positive sign; the "number of positive differences" shows the number of pairs in which the difference favors the control; the "average positive difference," then, is the first quantity divided by the latter. Similarly for negative differences. The "average difference" is simply the sum of all differences regardless of sign, divided by the total number of pairs, while the "net difference" is the algebraic sum of all differences divided by the total number of pairs.

It will be seen that, although the net mean difference for CA and IQ is on the whole in favor of the control groups, the number of pairs in which the D leads the control about balances the number in which the control leads the D (60 to 69). On the other hand, in Developmental Age, although the net lead is small (the greatest lead, 16 points, representing only 1 year), the number of times the control leads the D is 39, as against 16 pairs for the reverse—the delinquent is the less mature about 2½ times as often as not. As for the drawing, we find a ratio of 7 : 4 to express the average to-be-expected frequency for the delinquent to be inferior to the control. The figure varies from over 2 : 1 in the PS_{res} to barely over 1 : 1 for the PS_{trade}, but it always gives the superiority to the control.

Net differences in the neighborhood of 4 points represent *at least* a year's superiority for the control, for in all probability each point at the levels here represented will be found to be worth considerably more than the 3 months per point allowed by Goodenough. In addition to a net difference, if the control leads the difference is greater than the average of all differences, while if the delinquent leads it is by a margin less than the average difference. Whence we can say that in a matched comparison, holding MA, IQ, CA constant, the delinquent is more often inferior to the control (in drawing), and inferior by a greater amount when he does lag than he is superior in those relatively few cases when he does lead. The case is graphically presented in the diagram accompanying table VIIIb.

The distributions show the frequency of occurrence of each size of difference in the drawing scores for the individual matched pairs and for the two methods of scoring, for each of the three Public

School controls. A fourth distribution shows the same data for still another pairing of D and Control, a pairing which might rule out possible weighting effects resulting from repetition of some D-boy represented in each of the three sets comparing the single schools.

All D-boys were listed (with their controls) who appeared only once in the three lists. For the remainder, *i.e.,* those D-boys appearing in two or all three lists, a routine rotation was set up so that selection might be random between the schools. Suppose, for example, that X, a D-boy, is paired with a boy from PS_{res} and again with a boy from PS_{trade}; Y, another D-boy, is paired with a boy from PS_{cong}, but with no other; Z, still a third D-boy, appears in combination with a boy from each of the three schools. Y is acceptable immediately for this compound control pairing; X may be paired with the PS_{res} boy, but then Z must be paired with PS_{cong}; and now a pair must be taken from PS_{trade} before another from PS_{res} can be accepted. But the three distributions already given show less difference between PS_{trade} and D than between PS_{res} or PS_{cong}, and D. Then if some school must be favored in the number of pairings, let it be PS_{trade}, for then we shall be sure that the resulting difference will be of the lowest value consistent with random sampling. The final count of pairs accomplishes just this. Of the 36 pairs finally selected, 16 compare D *vs.* PS_{trade}, 11 D *vs.* PS_{res}, 9 D *vs.* PS_{cong}.

The distribution of the differences for these 36 is shown in dots. An additional 11 pairs of boys under 14–6 CA, all paired with PS_{res}, are shown in crosses, superposed on the main body of 36.

But there remains to be settled whether there is any significance to be attached to the fact that a delinquent group shows inferiority in drawing ability when compared to a control group. Is it not possible that a group of boys who are inferior as judged by conduct and social standing in general may be inferior in a generalized sort of way? That is, is it not conceivable that, no matter in what respects the D and Control may be matched, in other respects the D will be consistently below the Control?

When CA, MA, IQ were controlled (held constant), Drawing Score was seen to remain inferior in the D-group. Suppose the groups now to be matched for CA and Drawing Score, will MA be inferior for the D-group (lending support to the "Generalized Inferiority" thesis) or will MA now be higher in the D-group (lending support to a contention that, in order for delinquents to draw on a par with non-delinquents, their MA must first be raised in relation to the control group)?

To answer this question, groups were matched as follows: (1) D *vs.* $\mathrm{PS}_{\mathrm{trade}}$: (a) boys paired provided their CA's were identical to the nearest month; (b) boys paired provided their CA's were within 4 months of one another *and* their drawing scores by Limited Extension were within one point of each other; (2) D *vs.* ($\mathrm{PS}_{\mathrm{res}}$ over 14–5 and $\mathrm{PS}_{\mathrm{cong}}$): (a) and (b) as for D *vs.* $\mathrm{PS}_{\mathrm{trade}}$. There resulted, then, two pairs of comparison groups: one in which CA, only, is controlled; and one in which both CA and drawing ability are controlled.

Table VIIId presents the results of such a treatment of the data. At the top are shown mean (avg) values for CA and MA for the various groups. At the bottom is an analysis of the behavior of MA within the individual pairs of boys.

It will be seen that there is a tendency for the MA of the D-group to be raised when the drawing score is held constant; that this tendency causes a reversal of relative standing with the $\mathrm{PS}_{\mathrm{trade}}$ for control, but that it is insufficient to counteract the strong initial lead in MA of the public high schools; and that the tendency is more clearly shown in the analysis by pairs than in the group means.

In the case of D *vs.* $\mathrm{PS}_{\mathrm{trade}}$, the means for the total groups show the D-group to trail PS by a half year of MA. Equation for CA (19 pairs) shows the D-group still in the rear by 3 months. But when Drawing Score and CA are equated, the D-group is forced into the lead by 10 months of MA. In terms of individual pairs, the ratio of expectancy of superiority of Control over D is reduced from 11 : 10 to 7 : 10—from a nearly 50–50 proposition to about a 40–60. In the case of D *vs.* High Schools the initial lead of 1½ years of MA is not overcome, nor even appreciably reduced; but the ratio of expectancy of superiority in individual pairs is reduced by a half.

If the reader is inclined to look upon the delinquent as an inferior individual, it must be admitted that these tables cannot force him to see in the inferiority of drawing ability of the delinquent any peculiar significance. But there are several facts to be pointed out in this connection. In the first place there is the matter of the relationship of Drawing Score to MA. The fact that it is a loose one precludes the possibility of any clear-cut results from this analysis.

In the second place, there is a growing realization that the delinquent is not a being who can be presumed to be inferior without experimental proof, and hence that any demonstrated inferiority may be significant. For some time the matter of IQ has been under fire, and by now it is fair to quote Blackey or Olin (5) or (40) as representing a conservative position in saying that IQ bears little relation to social adjustment or expectation of that adjustment. It is the emotional-attitudinal make-up of the individual and of the persons surrounding him which determines in greatest measure the social or anti-social nature of his living.

A definite superiority of the delinquents of the school from which the D-groups of this study are taken, over public school children, has been shown for the paper form of the Stenquist Mechanical Aptitude Test,* in which they range from Stenquist's 20%-ile up, with a median at the 75%-ile. The same sign of superiority is shown in a New York study of delinquents and their non-delinquent brothers (57). In this same New York study, the non-delinquent brothers and the delinquents were found to be on a par in Porteus Maze quotients (83 as against 81½), both being low.

Murray (38) finds that in a test for athletic achievement the D and Control groups are about on a par; the high school boys excelling where the task demands a formal technique, the delinquents leading in matters of strength, running, or throwing. But the delinquent is far outdistanced in a test of "play information."

It has long been recognized that in matters of moral and ethical *knowledge*—mere acquaintance with right and wrong—there is parity between D and Control. But, since Thomas' study (50), it would appear that in matters of interest there is likewise little to distinguish delinquent from non-delinquent. They attend and enjoy the same movies, they choose the same type of radio program, of newspaper features, of recreations and sports, and much the same magazines.

Finally, Shaw & McKay (47) attack one of the principal supports of the old-time theories of delinquent causation—the Broken Home. They show that, in controlled experiments, the rate for Broken Homes may actually be greater for the Control than for the D-group. They go further to show that there is not even any consistent variation between Rates of Broken Homes and Delinquency Rates either within national groups or within given city areas.

---

* Piper, L. A., & Horton, C. B. Unpublished study.

In summary, then, of these last few pages, let it be said that there is no longer ground for a theory of "generalized inferiority" in the delinquent; each demonstrated inferiority merits separate consideration.

Before leaving this chapter on quantitative results, it will be interesting to set forth an interpretation of some of the data of table VIb, which, though based on figures of little statistical significance,* may be suggestive. Table VIc shows the data in a somewhat more easily comprehensible arrangement.

It will be seen that CA, MA, and Furfey score are quite nearly alike for the two high schools, PS_{cong} and PS_{res} over 14–5, but that their drawing scores are not quite on a level; there is a ratio of $D/_{SD_{diff}}$ of about 1 in favor of the "residential" school. This figure is statistically highly unreliable; it indicates a like sign for the difference in only about 85% of samples. (About 1 in 6 samples would show the lead reversed). But it shows a distinct *tendency,* at least; and this tendency is repeated in a superiority of about the same value over the trade school (PS_{res} over 14–5 *vs.* PS_{trade}). The "congested" high school, however, shows no reliability at all in its superiority over the trade school (PS_{cong} *vs.* PS_{trade}). Provided always that the samples are fairly drawn, the indication from these three differences is that the home background is of greater consequence in determining drawing ability than is the "quality" of "intelligence"—that is, the degree to which a boy is "book-minded" *vs.* "hand-minded," if one may be pardoned the use of such homely phrases. For PS_{res} and PS_{cong} compare quite well, as groups, in their language tests, and the schools are comparable in academic standing; but PS_{res} leads in home background, as it does also in drawing. PS_{trade} and PS_{cong} compare quite well as to home background and drawing, but differ academically. Finally, PS_{res}, although superior to PS_{trade} both academically and in respect to home background, leads the trade school in drawing by only slightly more than it leads PS_{cong}.

The importance of the home and neighborhood background is indicated again by the data from the SH group (see table VIa, bottom). The CA range for that institution unfortunately unfits the data for direct comparison, except with the delinquents in the fourth "matched comparison group," table VIIIa. The numbers are throughout so small as to render statistical treatment useless. It will be seen, however, that, whereas for each of the other matched groups there is consistent superiority of control group over the delinquent, there is such an intermingling of the points determining the curves for SH *vs.* D, diagram accompanying Table VIIIa, that the curves themselves have not even been attempted—and this for the score which is most likely to show differences (the ''Rev.'').

---

* See footnote, p. 44.

To bring out the added factor of behavior difficulty the 40 SH boys who were given the test were divided on the basis of case history information into a group (only 14 strong) whose adjustment emotionally and socially seems to be acceptable, and a group (the remaining 26) whose adjustment leaves much to be desired. Specific behavior problems are commonly mentioned for the latter group. The median performances of these groups in various functions (CA, MA, IQ and Drawing) given in table VIa, bottom, indicate essential parity. But it does happen that the lower drawing score goes with the poorly adjusted group; that 35% of the poorly adjusted have drawing scores of 27 or below whereas only 21% of the 14-group have such scores; and that the middle 50% of the poorly adjusted spread over the 12 points from 26 to 38, while the middle 50% of the others spread only the 7 points from 28½ to 35½. Thus we see again inferiority in the problem group, and greater variability.*

III. Summary

1. Results for the total groups of this study show consistent superiority of mean drawing performance for the control boy over the delinquent.

2. Differences in mean drawing performance for boys of like CA are statistically reliable as between delinquent and public school.

3. Dividing the total groups of older boys on a basis of IQ level reveals a tendency for the median drawing score to be determined rather by the group than by the intelligence of the sub-group from which it comes.

4. Selecting cases with a view to holding CA IQ MA constant reduces the amount of differentiation between the experimental and control groups so made up; but the sign of the difference with respect to drawing score remains constant.

5. Pairing the individuals of the ''matched groups'' reveals a tendency for the public school boy to be superior to the delinquent nearly twice as often as for the reverse to be the case; for the lead of the public school boy over the delinquent to be on the average

---

* See footnote, p. 44.

greater, for the (rarer) lead of the delinquent to be on the average smaller, than the average of all the differences.

6. The lead of the public school boy over the D boy for the matched groups is on the average 4 points throughout the distribution (5 points if scoring is by ''Limited Extension''). Differently expressed, a D boy at any point in the distribution has the drawing score of the public school boy at the level 15%-ile points below him.

7. Greater dependence of drawing level upon differences in home background than upon academic or intellectual differences is suggested by the almost negligible superiority of the State Home boys over the D-group matched for CA MA IQ, and by the relative standing of the three public school groups.

8. Behavior disorder may contribute something to the total inferiority of the delinquent compared to the public school boy. Feebleminded groups selected only with regard to problem behavior or lack of it show a suggestive superiority of drawing score for the conduct O K group (D/σ_{diff} shows 85% reliability), and a statistically reliable difference in the proportions of children whose drawing scores are inferior to their general intelligence level.

9. Behavior disorder may tend, in the long run, to be associated with low drawing score, but it also accompanies high scores, so that the variability of scores in a problem group is insignificantly but consistently greater than in a ''behavior OK'' group.

10. A matching, pair by pair, of D and Control boys for C.A. and Drawing Score gives added support to the findings above set forth, through the consequent tendency of M.A. to rise.

CHAPTER VII

QUALITATIVE DIFFERENCES BETWEEN DRAWINGS

In the appendix there appear a number of the drawings submitted by various boys of the groups studied, selected partly to give the reader some idea of the range of excellence and some idea of the "run of the mine" in the task of Drawing a Man, and selected also with a view to illustrating specific points to be touched upon in this chapter.

In turning the pages of any collection of drawings from a random sampling of the child population, one will be struck by the occasional occurrence of a drawing which is quite bizarre. A few of these pictures will, on closer scrutiny, be judged to be specimens simply of accident due to poor drawing ability. Such, for instance, might be the decision in the case of P. (Fig. 31, Appendix.) Others will reveal curious internal inconsistencies, incongruities, or omissions, and so suggest flight of ideas, poor attentional control, dissociation of ideas, instability, or some other abnormal or undesirable condition in the personality make-up of the drawer.

Thus, for example, in the drawings of N (Fig. 21) there occur: A mature representation of hair, together with a regard for detail in the showing of nostrils, of moustache, and of straggling facial hairs on one side of the face*; a curious appreciation of mouth-shape incompletely carried out; a forgetting of the hairs on the other side of the face. His attention to detail is sporadic, for the whole head is crude, and its outline infantile. There is a definite attempt to show shoulders and hands (relatively mature) together with a total disability to get the general build of the trunk; although the figure is "clothed" (buttons and belt), the umbilicus is shown, and probably also either an attempt to show the sex organs or else a definite symbolization thereof. His difficulty with the trunk is characteristic, for it can be seen to some extent even in the better of two auxiliary attempts; and in an incomplete drawing of ten months before, he did the same thing with the trunk as in the principal drawing here given. Finally, the legs are not even attached to the trunk.

There can be no doubt of the boy's effort. His principal figure shows many attempts erased, and he has made two other (incomplete) drawings. Furthermore, one can see that he is dissatisfied—that he realizes in some way the shortcomings of his work, but that he *cannot* see *what* is the matter.

---

* In the printing some of this detail has been lost, so that those "straggling hairs" may look to the reader more like shading of the ear.

Turning to another boy, we see that Mc (Figs. 15–18) is consistent in the detail of the eyes and in the general superiority of the head to the rest of the drawing. In three of the four drawings made, he does the same type of thing with trunk, legs, and feet. Of all the boys canvassed, he is the only one who gives fair promise of ''correct'' proportion and shape of trunk, and yet fails of all attempt to close it at the bottom. The attempt which shows just a head in profile is interesting; he has filled the whole sheet with large detail, though knowing full well that he was expected to draw a *whole* man. Again, the combination of two dimensionality and fair detail of head, hands, and arms leaves us quite unprepared for the crudity of legs and feet in his principal drawing.

The matter of bizarre drawings is no new discovery. Earl (17) speaks of ''indications of psychopathy in drawings,'' listing: perseveration of form and of detail, repetitive drawing, perseverative and/or meticulous shading, dissociation, sex symbolized or frankly expressed, and ''idio-significant detail,'' by which he means details or entire drawings unintelligible to any but the drawer.

While features of the sort enumerated by him would be immediately striking and would be counted by the author sufficient reason for classifying a drawing as ''Incongruous,''* they represent for the most part far greater departures from typical or normal performance than are generally to be found in the present collection. In any further research into incongruous drawings, Earl's analysis should probably be taken into account, but main stress should be laid on two sorts of internal inconsistency. The one is a failure to finish something already begun, and possibly indicative of attention lapse or flight of ideas—hand drawn on one side only, for instance. There will be several subclasses, among them: (1) Detail from one side entirely lacking on the other—apparently not thought of at all. (2) Detail on one side carried out with meticulous care, and on the other side roughly or crudely done. (3) Detail on one side indicative of mature level of observation and on the other side at an infantile level. The second important sort of internal inconsistency is a discrepany in age-level from one detail to another, as for instance facial details on a high level, rest of body and limbs infantile. A principal subgroup would be the drawings in which the whole figure is pretty well on a level, but with some important detail omitted, as for instance the arms.

---

* Such drawings were referred to by the author originally as ''A-typical,'' but it soon became apparent that that term is subject to misconstruction. For ''a-typical'' the words ''incongruous'' and ''vagarious'' have been substituted. What is being attempted is, to describe in a word that quality which either makes the picture internally inconsistent or makes it strikingly incongruous with other pictures of the class from which it is taken.

It is this matter of age-level which involves the major portion of the work to be done. Goodenough and others before or since give us good tables of age level for the appearance of indications of the various itemized details—as, for instance, when we can first expect to find a child showing mouth, or arms, or neck, or fingers, etc. But no figures at present exist to tell us characteristic methods of showing the mouth, or at what level one may expect the eye to assume some shape other than circular; nor does any one tell us what combinations to expect—eyebrows with crude eyes, teeth with fairly well developed mouth, etc.

But however difficult it is to define this quality of incongruity in drawings, and however subjective the judgment thereof must necessarily be, the fact is that it is a definite enough *something* for independent judgments to show remarkable agreement. Diagram 9 shows the distributions of judgments for two and three judges acting independently of each other, following the general instruction to glance through the drawings to see the run of them, and then to classify them on a four-fold basis. ''In the first place,'' it was said, ''You will find a certain number of drawings which will impress you as 'queer'; they might suggest a disturbed personality, they might suggest a crazy subject, they may impress you as being no more than distinctly and emphatically different from the run of papers. I don't wish to bias your judgment more than need be, for I wish you to come to the task fresh; I want your independent opinion. But I can say this: in the first place, you are not to judge on the basis of childishness. A child will draw childishly, and still his drawing will be typical; it will be typically childish. On the other hand, if there is a drawing in which mature and immature are much mixed up, you might well be struck by a general sense of queerness. In the second place, a drawing which is crude or poorly done or wears a 'wild' expression will not necessarily be a 'queer' one; it may be simply that the boy is no artist, that he cannot do the things with his pencil that he would like to do. The score credit in these drawings is being given according to the completeness of the child's notion of a man—the details which he tries, however inadequately from an artistic point of view, to indicate. Try to make your comparison, analogously, a matter of what the boy tries to do, rather than *merely* the artistic adequateness or the maturity which he shows in the execution.

"Those pictures, then, (which we are going to call simply by the conservative name 'Incongruous') are to be set in one pile. A certain number of others will impress you as being quite normal or consistent within themselves; there will be nothing about them to make you think of the word 'queer,' even though they may be of a quality to make you laugh or may be childish or even infantile. These belong in a separate pile. About others you are going to be more or less hesitant. The first two piles are ones of which you are quite certain. Now if you come to a picture which you feel to be incongruous, but still you would be unwilling to declare your opinion on oath, so to speak, place it in a third pile; and if you find one which you think is probably internally consistent, but of which you are not quite sure within yourself, place it in a fourth pile. When you finish, then, all the drawings will have been graded from surely consistent within themselves, through the probably consistent and the probably incongruous to the surely incongruous."

Judgments by W. E. H. are the author's. L. E. P. is a clinical psychologist who has for years used the Goodenough test on several hundred subjects each year, and should therefore be in a position to pass with considerable accuracy on questions of what to expect, with the single reservation that her experience is largely with drawings from feebleminded. L. M. K. is a clinical psychologist several years in the field, one who in her test training had some experience with Goodenough drawings, but who has since then had very little to do with them. In addition, two lay observers were asked to go through the drawings of the delinquents, independently of each other.

The agreement between judgments may be expressed by the Coefficient of Mean Square Contingency, a quantity similar in nature to the coefficient of correlation, but applicable to data capable only of qualitative classification; or it may be expressed by the quantity X^2. Since the size of the coefficient varies with the number of cell entries, its interpretation is not readily made by all readers, and so X^2 has been used in addition. In place of an expression of relationship between two quantities, X^2 gives an idea of the probability or improbability of a pair of observed distributions arising from chance. If the probability is small, the distributions are probably closely related.

Mathematically, $X^2 = PN - N$

where N = number of cases

P = a quantity dependent on the size of the entry in a particular cell of the scatter diagram in relation to the expected (theoretical) size of this entry if there were no actual relationship between the two separate distributions; that is to say if, in this particular case, there were no association between Judge A's and Judge B's reactions to the same pictures, a condition which we would obtain if the quality "queer" were something defined entirely differently in the minds of the two judges.

C, the coefficient of contingency, also depends on P.

Mathematically, $C = \sqrt{\frac{P-1}{P}}$, and for a 4×4 fold table such as we have here, the highest value it can ever have is 0.866.*

In addition to the high agreements between two judges, represented by the obtained values of C and of X^2, there is to be reported an absolute agreement of all three judgments in 44% of the cases for PS_{trade} and of 32% for the D-group. If, in addition, one counts not only the cases of absolute agreement, but also those in which the third vote is only one category removed from the other two, there are 86% of trade school boys and 80% of delinquents included. In the case of the delinquents, of the 7 drawings for which the 3 judges agree in the verdict "Incongruous," both lay judges agree as follows: for 2 of them, both say Yes;** for 4 of them, both say Yes?; for 1 of them, they are divided between Yes and Yes?; but in all 7 cases, all five judges vote Y. For the 4 drawings pronounced "probably incongruous" by all 3 judges, lay judgments are as follows: in 2 cases, both are Yes; in 1 case, both are No?; in 1 case they are divided between No? and Yes? For the single case of "probably consistent," the lay judges are both certain of the consistency. For the 9 drawings agreed to as "typical" or "consistent," both lay judges agree in 8 cases, and are divided between No and No? in the 9th.

---

* Calculation of P and of C explained in detail: Garrett, H. E., *Statistics in Psychology and Education*, pp. 196–203.

** Hereafter Yes will mean "incongruous." Yes? will mean "probably incongruous." No will mean "internally consistent." No? will mean "probably consistent." Y will mean either Yes or Yes? N will mean either No or No?

The obvious conclusion to be drawn from such concert of opinion is that there is here some real quality being judged.

As an attempt to estimate the "repeatability" or reliability of such judgments, the author went through a number of the pictures of the D-group a second and a third time, after lapses of several months. Although he remembered the majority of the pictures well enough (the drawings have a very potent memory-value for the author), he had quite forgotten how he might have classified them previously. 18 drawings have been judged 3 times, for an absolute agreement of 50% of the cases. There is agreement of two votes, with the third no more than one category removed, in 95%. One case, M., fig. 36, appendix, showed no agreement at all (No No? Yes?); but the other judges are likewise at variance, distributing themselves over the same range: No No? Yes? For 10 additional cases, W E H has made two judgments with 80% agreement and no single disagreement of greater than 1 category.

It would appear, then, that the property of Incongruity is one which can be reliably judged.

This matter of internal consistency has required extensive presentation because there is a very notable lack of previous work on the subject, and because it presents us with one of the chief points of difference between delinquent and control drawings. Table IX presents the frequency of occurrence, in terms of percentage, of the various degrees of incongruity in the different groups studied. Both W E H's and L E P's judgments are given in full; W E H was the only judge for PS_{res}. L M K's judgments for D and PS_{trade} are also given.

Both L E P and W E H agree in placing the frequency of incongruity (Y) in the public school groups at about 16%, while even the more conservative judge places the frequency for the delinquents at at least twice that figure, with a value of 2 for the ratio D/σ_{diff}. Averaging results for W E H and L E P we find a D/σ_{diff} of 3, which suggests a reliable difference in the proportions Consistent: Incongruous as between the D-group and the public school control groups.*

One in six of the public school boys gives an incongruous drawing; from one in three to one in every two delinquents does so. For the certainly consistent and the certainly incongruous drawings the figures are more variable than for the N–Y summary, but they average to show that the deliquent produces a Yes drawing twice as frequently as a control boy, and that the control produces a No drawing more frequently in the ratio 3 : 2.

---

* Using D. over 14–5 and PS_{trade}, and averaging judgments by all 3 judges, we find a D/σ_{diff} of 2.2 for these proportions.

Matching subjects for MA, CA and IQ leaves these findings to a great extent unaffected, as may be seen from Table VIIIa. For W E H judgments, the average D/σ_{diff} after such pairing is 3.4, showing a reliably greater frequency of incongruous drawings in the D-groups. L E P's judgments, as before seen, are considerably more conservative yet they yield a D/σ_{diff} as between incongruity in Delinquent and Control groups varying from 1 to 3, with an average ratio of 2. Averaging results for W E H and L E P we find that the difference in frequency of occurrence is probably well over twice the S D of that difference.

In the case of drawing score, the dependence of the score seemed to be upon the home background of the boy in some measurable degree. In the case of incongruity, we seem to have something more specific for delinquency; or, rather, the author would say that incongruity is a frequent characteristic of delinquents' drawings, though by no means is it to be implied that incongruity in a drawing is indicative of *delinquency.*

In the presence of this quality in a drawing, it would seem that we have an intimate insight into the personality of the subject, an insight into some instability or other undersirable property of the personality, extending sometimes almost to psychopathy, but indicative at least of some conflict within the psyche. Goodenough (23) lists the psychological processes involved in the drawing of a man, without outside aid or suggestion. They include:

> Analysis of the object to be drawn into its component parts.
>
> Evaluation of those parts, and selection of those which appear essential or characteristic. This is largely an unconscious process as far as the child is concerned, but significant since it is decided by the nature of his interests and *by his fundamental habits of thought.*
>
> (Italics are the author's)
>
> Analysis of spatial relationships, *i.e.,* of relative positions.
>
> Analysis of quantitative relationships, *i.e.,* of relative proportions.

> Reduction and simplification of the several parts into graphic outlines, through further processes of abstraction.
>
> Adaptability, represented by a capacity to adjust the drawing scheme to the new features added from time to time as the concept (of ''man'') develops.

She goes on to quote J. S. Mills to the effect that ''The observer is not he who merely sees the thing which is before his eyes, but he who sees what parts that thing is composed of. . . .'' Some, in their haste, overlook half the data; others are unable to distinguish later between what was seen and what was furnished by imagination; still others will report qualitatively correctly, but will distort the relative quantities.

In the case of incongruity, there is a curious breaking-down of observation and analysis; sometimes it is a matter of faulty evaluation of the parts, sometimes it is a fault in the spatial or quantitative relationships, sometimes it is a curious combination of performances, each one acceptable by itself, but each representative of analyses at different age levels. On the other hand, a normal drawing may not necessarily indicate a normal personality, for, if our analysis of the drawing act is correct, only those disturbances of the personality which affect the ability to evaluate the parts of the object or the relationships existing between those parts, etc., will affect the drawing; and it is quite conceivable that there may be personality disturbances which do not have such a result. But where one finds an incongruous drawing, there he may look for some imbalance in the personality.

On pp. 79–82 will be found case history material illustrating what is meant here. Boys from three sources are covered: (1) From the D-group are taken the seven boys for whom there is concurrence of opinion as to the certain normality of the drawing and the six for whom there is equal unanimity of opinion as to the incongruity of the drawing; (2) from the N.Y.C.C.H. records are taken seven cases of undoubtedly incongruous drawings; (3) from PS_{res} are selected those four boys whose drawings the author judges to be certainly incongruous. It will be seen that those whose drawings have been judged incongruous present, on the whole, a poor picture of emotional balance or of background from which such balance could be expected to emerge, but that the same sort of thing can be said of the (delinquents) with normal drawings. In other words, the drawing may serve to call our attention to a boy as one who should be carefully followed up; in addition, it may be that the *character* of the drawing—whether small and all in a corner, or bold, or large but much erased—can be made to give us some hint as to what to look for beside merely "imbalance." But the drawing test can not be relied upon to locate all in a group who need such individual follow-up.

A second qualitative approach to the drawings is in the matter of what we shall call "characterization." A little child draws simply "a man"; an older child draws *a* man. The first is simply a stereotype—a formula—to indicate a human as the subject rather than a house or an animal; it may or it may not show sex differentiation, but that is the limit of individuality which it will possess. An older child, on the other hand, draws a hunter, a soldier, a boy fishing, a business man, or some other definite kind of man. One of the high school boys told the author that when he heard the phrase: "Any kind of man you like," he said to himself, "There are other kinds besides Americans; I'll draw an African on the hunt." In general, the older the child, the more specific is the drawing—a principal conclusion of Thomson's study (52).

Table Xa shows the summary of characterizations for all the groups except SH as judged by the author acting in collaboration with a lay person. The figures show *percentages* in all cases except for the row "N." "N" shows the number of cases in the group which possess real character, with a subscript to show the total number in the group. The figures for "Sterotype" show the proportions of the total groups which have not advanced beyond the early level of generalized man; the rest of the table shows proportions of each type of character in the remainder. The column for older delinquents, then, reads as follows: 43 drawings are analyzed, of which 30% are "stereotype," leaving 30 drawings having some individuality. Of these 30, 57% are civilian of some sort; 27% are either cowboy, soldier, or sailor; the remainder are miscellaneous.

A comparison of the frequency of stereotypes is first of all illuminating, since we see that there are 3 groups operating at about the 30% level, and 4 at about the 20% level, while one has over 50% of all drawings stereotype. The trade school, which in matters of score and Incongruity-Consistency compared very favorably with the high schools is seen in this regard to be on a level with the (residential) grade school and with the older delinquents. And yet, when the trade school boy does give character to his drawing, his characterization is on the high school level. This behavior of the trade school would seem to place it between public school and delinquent, as indeed it is, for it resembles the one in its social conformity and the other in its social and intellectual background.

At the same time that the trade school has slipped a bit downwards, the delinquent group has done likewise. Whereas in *score* the younger delinquent and the grade school boy (2 years younger) draw on a par (Table VI), in characterization the *older* delinquent and the grade school boy (5 years younger in CA, 3½ years younger in Furfey Age, and 2½ years younger in Mental Age) are on a par. In the matter of characterization, the younger delinquent is in a class inferior to anything tested in the public schools.

If now we consider the distribution of character among those drawings left over after subtracting the stereotypes, we find that the grade school boy and the younger delinquent are both very fond of "blood and thunder" types. Although not many guns are being fired, one finds a number of Wild West characters, soldiers, sailors, pirates, etc. As the boy grows older, he leaves that day-dream phase of his existence behind, and his thoughts are more likely to be occupied with things "nearer home"—he draws civilians of one sort or another, though they may still be active (athletic) or fanciful (caricature) or may represent emotional outlet (humorous situations).

Table Xb for the matched groups deals with small numbers, but the same general trend is to be seen—a greater juvenility in the delinquents in the proportion both of the "stereotypes" and of the "adventure type," while the proportion of "civilian" types is greater for the controls.

A third qualitative analysis can be made in respect to the "realness" of the drawing—the motion or posture conceived by the drawer. The first drawings of a child show no thought of motion; later there comes an indication of it rather from the context in the drawing than from anything in the drawing itself; still later there is indication of it by some special treatment of the parts particularly involved, but there still seems no appreciation of motion throughout the body. The leg may be raised, for walking, but the rest of the figure is stiff; the whole gives an appearance of "wooden soldier" rather than of "flesh and blood." We shall call this "incomplete motion." Analogously in the case of posture, the little child has no thought of pose—his stereotype is simply there on the paper. If it is tipped, or on its side, or upright, it is all one to the child. Later, his subject stands or sits or poses, but again as might a wooden soldier; still later there is evidence of the creator being inspired with some adequate notion of ''joints'' and the way the body should hang. These we shall style respectively ''posture stiff'' and ''posture shows some sign of life.''

The differences are smaller for this sort of analysis than for the two qualities before considered. It may be largely because of the difficulty of avoiding confusion from the varying artistic merits of the pictures; it may be that there is nothing here to be found; it may be that the boys of this study are beyond the age where such differences would show; it may be that there is no difference between the groups analyzed. Whatever the reason for negative findings, it is not inability on the part of the judges to agree, as will be seen from diagram 10, with their agreements of about 60% to 70% on a 5 x 5 fold classification.

Table XIa gives the proportions for total groups, averaging the judgments of 3 persons, two of them (lay) working together, and one (the author) working independently. The analysis in this table is carried out in two ways: first, considering ''incomplete'' motion and ''stiff'' posture as about on a par and intermediate between ''stereotype'' on the one hand and ''complete'' motion or ''life-like'' posture on the other; secondly, considering motion and its depiction as possibly a separate order of concept from posture and its depiction. When matched groups are considered (table XIb) most of the difference exhibited in table XIa disappears, except the greater incidence of stereotype (lowest level) among the delinquents. But the comparison of total groups shows us a tendency for the older boys in every case to go in for posture rather than motion. Also, there is some indication, in PS_{res}, that the older boys achieve more often the 3rd degree of representation, and that the grade children remain more often at the 2nd degree level. In the matched groups, the same can be seen, though with somewhat smaller differences.

A graphic summary of the distributions (for the matched groups) of the 3 qualities of this chapter is given in diagram 11. It will be seen that for all groups and for both judges the incidence of incongruity is unfavorable to the delinquent; that the distributions for characterization are rather distinct, with the D groups the less matured, and that with respect to Motion-posture the differentiation is less, but what difference there is indicates greater maturity of the control.

Summary

1. There is a quality—incongruity, or ''queerness''—occasionally occurring in boys' drawings which, though subjectively judged, can be judged reliably and with good agreement between judges.

2. Case history evidence suggests a relation between the strongly incongruous drawing and personality disturbance of one sort or another—*e.g.,* emotional instability, psychopathic tendencies, etc. But it is a relationship which works in one direction only, for an unstable personality may make a perfectly consistent drawing.

3. The frequency of occurrence of such incongruous drawings is at least twice as great among delinquents as among public school controls, and greater than for State Home children; and this difference persists in spite of matching groups for CA, MA and IQ.

4. Drawings may be classified according to the kind of man which the boy is trying to depict, and there is a demonstrable relation between type of subject attempted and age of boy.

5. The delinquent is at a relatively less mature level (as judged by the type of man he draws) than the public school control of like age, and this difference is still visible when CA, MA, IQ are held constant.

6. Drawings may be classified according to the manner of depicting motion or posture, or the absence of any idea of either of these qualities, and there is probably some relationship here, also, with maturity.

7. The delinquent is not markedly different from the public school control of like age in this last classification, except in the fact of greater frequency in the delinquent groups of drawings at the very lowest level of all.

CHAPTER VIII

RECAPITULATION

I. The Problem

(1) A study of the Goodenough Drawing Test in Relation to Delinquency, investigating the differences in performance, both by descriptive and by scoring techniques, found to exist between "delinquent" and "non-delinquent" boys.

Incidental to this, a determination of the relationship between development as measured by the drawing and Developmental Age as measured by the Furfey Scale.

(2) An exploration to determine the feasibility of extending the Goodenough scoring method to the end of improving the test for use with children over 10 years of age.

II. Experimental Procedure

A. *Personnel*

(1) Main experimental group—delinquent. N = 81

Random selection from a state institution for delinquents. Subjects: boys, 9 to 18 years of age, over 80 IQ, without gross neurological defect.

(2) Control groups—non-delinquent.

a) For departure from the delinquent group both in academic ability and in economic level. N = 113

Selected from the public schools of a residential community; random within age-grade limits, except for elimination of gross physical defect.

b) For departure from the delinquents in academic ability, holding economic level "constant." N = 55

Selected from a public school drawing from the foreign and congested section of a city population. Same age-grade limits as in a), same rejection of physical defects; further limited by low economic level for parents' occupations.

c) For comparability with delinquents in both academic ability and economic level. N = 65

Selected from public trade school; random within age-range 15 to 18 years and IQ above 80, except for elimination of gross physical defect.

d) For comparability with delinquents in home background and in institutionalization. N = 42
Selected from state home for dependent and neglected children; random within age-range 9 to 18 years and IQ above 80.

(3) Matched comparison groups—delinquent *vs.* non-delinquent.
a) For comparability of CA, MA, IQ; other differentiation as above in 2a, 2b, 2c, 2d.
Selected pair by pair from delinquent and control groups. CA and MA within ± 4 mos., IQ within ± 5 points.

(4) Secondary experimental group—conduct disorder. N = 29
Selected at random from an institution for feebleminded. Subjects: boys, age-range 9 to 18 years, IQ 50 or over, without physical or neurological defect, history of conduct disorder.

(5) Secondary control group—conduct acceptable. N = 40
Selected from same institution as for (4); same requirements, except no history of conduct disorder.

B. *Tests Used*

(1) Goodenough Drawing Test—given to every boy.

(2) Language test for general intelligence—given to every boy.
(Not same test to every boy, but some test to each boy. Tests chosen from: Stanford-Binet, Terman Group, Otis Self-Administering—both Intermediate and Advanced—, National Intelligence, Illinois General Intelligence.)

(3) Pintner Non-language Tests of Mental Ability—given to every boy in groups: "delinquent," "congested high school"; "trade school."

(4) Furfey Revised Scale for Measuring Developmental Age in Boys—given to all groups except "state home" and "feebleminded," with the added exception of a few delinquents not available at the time of the test.

C. *Administration of Tests*

(1) Most tests given in groups of 10 to 50, well proctored.
a) Intelligence tests given previously by competent examiners, accepted as valid for this study.

- (2) Instruction for tests.
    - a) In the case of intelligence tests, instructions literally followed.
    - b) In the case of drawings and Furfey scales, literal instructions departed from (Procedure detailed, Chap. III).

        Uniformity of subjective attitude considered of greater importance than uniformity of instruction.

III. Results and Findings of the Experiment

- A. Applicability of the drawing test to older subjects demonstrated.
    - (1) Figures for reliability and variability of score compare favorably with those given by Goodenough for younger children.
    - (2) Group mean scores show superiority with increased C.A. up to 14 years, and with increased M.A. as well.
- B. Feasibility of the extension of Goodenough's scoring method indicated.
    - (1) Seven points already found are:
        - a) Preferential for higher original score.
        - b) Preferential for higher M.A.
            - i. Preference for higher maturity suggested.
- C. Aspect of development measured by drawings undefined.
    - (1) Correlations show:
        - a) Weak relationship to general intelligence.
        - b) Weaker relationship to Developmental Age, but still positive and statistically significant.
- D. Miscellaneous findings in respect to *score* differences.
    - (1) Inferiority of delinquents indicated.
        - a) Mean scores for total groups show consistent and reliable superiority for the public school control over the delinquent.
        - b) Median scores for groups subdivided according to intelligence seem to depend more on the group than on the IQ level within the group.
        - c) Single pairs selected for rigid control of age and intelligence show the delinquent inferior to the control more often than superior, and show the average amount of such inferiority to be greater than the average of the (rarer) superiority.

(2) Dependence of drawing score on home-background suggested by relative sizes of D/σ_{diff} as between different control groups.
(3) Association of behavior problems with (low) drawing score suggested by groups chosen to keep behavior the only variable.
  a) Mean or median score is depressed.
  b) Variability of score is increased.
  c) IQ computed from drawing is below IQ computed from Stanford-Binet.

E. Miscellaneous qualitative findings.
  (1) Inferiority of delinquents indicated.
    a) Greater juvenility.
      i. In choice of character for drawing.
      ii. In failure to progress beyond the primitive "stereotype" level.
    b) More frequent instability suggested.
      i. Frequency of incongruous drawing undisturbed by equation for CA, MA, IQ.
  (2) Incongruity of drawings probably a real basis for classification.
    a) Agreement between judges.
    b) Repeatability of judgment for same judge.
    c) A possible indication of disturbed personality.
      i. Case history material.
  (3) Motion and posture, both indicators of maturity.
    a) Posture indicates more advanced development than does motion.
    b) Differentiation between delinquent and control not demonstrated for this quality.

IV. DISCUSSION

This has been an exploratory study, and as such it has opened up some rich fields for further research.

(1) It has indicated the possibility of carrying the Goodenough method of scoring drawings to a greater degree of perfection, particularly in the direction of differentiating high levels of drawings. Such extension of the point-scale will need to re-establish a balance between "full-face" and "profile" representations, possibly by weighting of raw points, possibly by taking age or general drawing level into account; it will probably need to give credit for lack of

infantile characters as well as for possession of mature characters; it may have to enter the qualitative field more fully and boldly than the original 51-point scale, by evaluating characterization, motion, posture, and other qualities; it may even be necessary to determine by a rough scale the general maturity level of a drawing, and then to apply a scale or a system of weightings peculiar to that particular level.

(2) Further research is needed to show just what is measured by an ability-scale such as the Goodenough. That it is some sort of maturity is probable. Scoring of the high level drawings is at present so unsatisfactory that it would be unsafe to conclude drawing and general intelligence to be only weakly related. The same holds for the observed correlations of drawing with Furfey Developmental Age scores. But the observed correlation with Furfey score is, even now, significantly positive; it would not seem unreasonable to expect it to rise in the event of better scoring procedure in the case of the drawings; and so, no matter how the correlation with "general intelligence" might also rise with that better scoring, we can conclude with some assurance that the drawing does afford us an approach to the development of the individual by no means identical with accepted tests of general intelligence. Moreover, there is more in the evaluation of a drawing than a mere score of so-and-so-many points; there is indication of interests in the particular subject chosen and the manner of portraying it, there is indication of balance or imbalance, there is some clue, perhaps, to the degree of integration. In pursuing further the question of what it is that the drawing measures, the author would suggest correlating the scale with the extent of development of emotional control (habits, etc.), or with the extent of development of socialized habits and responsibilities, because of the fact that behavioral tendencies seem to be associated with certain score levels.

(3) There is need for further investigation of the relation between personality make-up and drawing performance of the sort here called simply "incongruous." There is need to define the quality more fully and objectively than is herein attempted, and to discover more of its significance.

(4) It would be interesting to conduct a controlled research of delinquents' drawings along lines allowing greater freedom of expression than this "Drawing a Man Test." It is quite possible, for instance, that, even if the boy should spontaneously choose a human for his subject, he might very well do something different from what

he does in response to the instruction to "draw a man"—something more unique, or imaginative, or revealing. The very fact of giving such generalized instructions may suggest to him a generalized or characterless man, particularly in the case of the delinquent or other institution child, whom we think of as all too often "regimented"—by force of circumstances necessarily prevailing wherever masses of children are handled.

If the children were told, first, "just to draw something," "anything," there would be gathered in quite a wealth of material for descriptive and evaluative comparison. Such a free drawing could then be followed by a drawing of the standard subject: "Man," for which the quantitative-objective method of evaluation is already available—at least in large part.

V. Conclusions

1. Extension of the Goodenough Drawing Scale to ages above 12 to 13 years has been found desirable and possible. Additional scoring points have been defined which constitute the beginning of such an Extension, and further possible points and scoring methods are suggested.
2. Correlations of the scale show drawing score to be only moderately connected with "general intelligence" at best, and to be closely enough related to maturity as measured by the Furfey scale for Developmental Age to indicate that it measures an aspect of development at least distinctly "tinged" with a non-intellectual maturity.
3. Some connection with maladjustment of the personality such as may give rise to delinquent or problem behavior is indicated, in respect both to drawing score and to quality of the drawing content; and some connection of these things with type of home background may be indicated, too.

In the Goodenough drawing-a-man test we have an instrument which promises to be useful in understanding certain behavior problems. In its application to delinquents it has revealed both quantitative and qualitative differences between delinquent and control groups; but it is not on this account to be supposed capable of measuring, diagnosing, or predicting delinquency. Delinquency is too complex; it depends on too many factors. Furthermore there are individuals in the control groups with drawings possessing the same characteristics which occur (more frequently) in the delinquent group. Of course one cannot on that account call those control individuals delinquent. But one can say that the test does reveal difficulties which may eventuate in delinquency—or may eventuate in some different direction; and one can say that it reveals proportionately more individuals with such difficulties in the delinquent than in the control groups.

The drawing test, used in group surveys, will be found not to be 100% accurate; it will pass over some who should be caught; it will catch some who should not be caught; but it should be a material help in locating and understanding incipient and present behavior problems.

BIBLIOGRAPHY

1. Ayer, F. C. Psychology of Drawing. Balto., 1916.
2. Barnes, Earl. A Study of Children's Drawings. Ped. Sem, 1893, *2*, 451–63.
3. Baumgarten, F. Zeichnungen der Schweitzer Jugend. Zt. Päd. Psychol., 1927, *28*, 367–71.
4. Bird, M. H. A Study in Aesthetics. Harvard Mon. Educ. *11*, 1932.
5. Blackey, Eileen. Social and Economic Adjustment of a Group of Special Class Graduates. Smith Coll. St. Soc. Work, 1930, *1*, 160–79.
6. Brooks, F. D. Accuracy of IQ's from Pairs of Group Tests in Junior High School. J. Educ. Psychol., 1927, *18*, 173–86.
7. Burt, Cyril. Mental and Scholastic Tests. London County Council, 1921.
8. Calhoun, C. H. A Follow-up Study of 100 Normal and 100 Subnormal Delinquent Boys. J. Juv. Res., 1928, *12*, 236–40.
9. Casselberry, W. S. Analysis and Prediction of Delinquency. J. Juv. Res., 1932, *16*, 1–31.
10. Cattell, P. Comparability of IQ's from Different Tests at Different IQ Levels. School & Soc., 1930, *31*, 436–42.
11. Cohen, D. N. The Goodenough Drawing Scale Applied to 13-Year-Old Children. Master's Thesis, Columbia Univ., 1933.
12. Cooke, Ebenezer. Art Teaching and Child Nature. London Educ., 1885.
13. Courthial, Andree. Emotional Differences of Delinquent and Non-Delinquent Girls of Normal Intelligence. Arch. Psychol., 1931, No. 133.
14. Dallinger, K. Ueber den Zusammenhang zwischen den Entwicklung des Ichbewusstseins und dem kindlichen Zeichnens. Päd. Mag., 1928, Heft, 1205, 119. Abstract in Zt. Kinderforsch., 1929, *35*, 173.
15. DeSanctis, S. The Welfare Problem of Pre-Delinquents. (Italian.) Soc. Sci. Abstr., IV, 4679.
16. Dyett, E. G. The Goodenough Drawing Scale Applied to College Students. Master's Essay, Columbia Univ., 1931.
17. Earl, C. J. C. The Human Figure Drawings of Adult Defectives. J. Mental Sci., 1933, April.
18. Eggers, M. M. Comparison of Army Alpha and Goodenough Drawings in Delinquent Women. Master's Essay, Columbia Univ., 1931.
19. Eng, Helga. Psychology of Children's Drawings. Beihefte Zt. angw. Psychol., 1927, No. 39. Translated: Harcourt Brace, N. Y. 1931.
20. Furfey, P. H. A Revised Scale for Measuring Developmental Age in Boys. Child Develop., 1931, *2*, 102–14.
21. Garrett, H. E. Statistics in Psychology and Education. N. Y., Longmans. 1927.
22. Gitlitz, Harry B. The Goodenough Drawing Scale Applied to 14-Year-Old Children. Master's Essay, Columbia Univ., 1933.

23. Goodenough, F. L. Measurement of Intelligence by Drawings. World Book, Yonkers, N. Y. 1926.
24. Goodenough, F. L. Studies in the Psychology of Children's Drawings. Psychol. Bull., 1928, *25*, 272–83.
25. Grimberg, L. Emotion and Delinquency: a Clinical Study. Brentano's, N. Y. 1928.
26. Hall, G. Stanley. The Contents of Children's Minds on Entering School. Princeton Rev., 1883, p. 249.
27. Ivanoff, E. Le Dessin des Ecoliers de la Suisse Romande. Arch. de Psychol., 1908–09, *8*, 98–156.
28. Katzaroff, M. D. Qu'est-ce que les Enfants dessinent? Arch. de Psychol., 1910, *9*, 125.
29. Kugaenko, A. Clinical Significance of Children's Drawings. (Russian.) Abstracted in Zt. Kinderforsch., 1928, *34*, 242.
30. Lawlor, G. W. Developmental Age in Feebleminded Boys. Master's Essay, Columbia Univ., 1930.
31. Lembke, W. Significance of Drawings by Bold and Shy Pupils. Zt. päd. Psychol., 1930, 459–63.
32. Levy, L. R. The Function of the Goodenough Drawing Scale in the Study of High School Freshmen. Master's Essay, Columbia Univ., 1931.
33. Lindner, Rudolph. Moralpsychologische Auswertung freier Kinderzeichnungen. Zt. päd. Psychol., 1914, Heft III.
34. Macoubrey, Constance. An Inquiry into Factors Affecting the Constancy of the IQ in Behavior Problem Children. Smith Coll. St. Soc. Work, 1931, *2*, 378.
35. Maitland, Louise. What Children Draw to Please Themselves. Inland Educator, 1895, *1*, 87.
36. McCarty, Stella A. Children's Drawings: A Study of Interests and Abilities. Williams, Balto., 1924.
37. Mohr, H. Zeichnungen von Geisteskranken. Zt. angw. Psychol., 1909, *2*, 291–300.
38. Murray, V. Comparative Study of Play Information and Athletic Achievement in Delinquent vs. Non-Delinquent Boys. J. Juv. Res., 1931, *15*, 111–20.
39. Oakley, C. A. Interpretation of Children's Drawings. Brit. J. Psychol., 1931, *21*, 256–70.
40. Olin, Ida. Follow-up Study of Social Adjustment of Children of Low Intelligence. Smith Coll. St. Soc. Work, 1930, *1*, 107–59.
41. Prinzhorn, Hans. Bildnerei der Gefangenen. Berlin, 1926.
42. Prinzhorn, Hans. Bildnerei der Geisteskranken. Berlin, 1922.
43. Raubenheimer, A. S. An Experimental Study of Behavior Traits in Potentially Delinquent Boys. Psychol. Monog., 1925, No. 159.
44. Reusser, J. L. Personal Attitudes of Delinquent Boys. J. Juv. Res., 1933, *17*, 19–34.
45. Ricci, C. L'Arte dei Bambini. Bologna, 1887. Abstracted in Ped. Sem., 1894, *3*, 302–07.
46. Rosanow, C. Is Lack of Intelligence the Chief Cause of Delinquency? Psychol. Rev., 1920, *27*, 147–57.
47. Shaw, C. R., and McKay, H. D. Social Factors in Juvenile Delinquency. Report on Causes of Crime, Vol. II. Washington, D. C. 1931.
48. Spielrein, S. Children's Drawings with Eyes Open and Shut. (German.) Imago, 1931, *17*, 359–91.
49. Thiel, G. Eine Untersuchung von Kinderzeichnungen taubstummer Schüler. Zt. Kinderforsch., 1927, *33*, 138–76.
50. Thomas, Coronal. A Comparison of Interests of Delinquent *vs.* Non-Delinquent Boys. J. Juv. Res., 1932, *16*, 310–18.
51. Thomas, Coronal. The Sims Socio-Economic Rating Scale in Delinquent *vs.* Non-Delinquent Boys and Girls. Am. J. Orthopsychiat., 1931, *1*, 527–39.
52. Thomson, J. L. Children's Drawings: An Experimental Study of Perception. Master's Essay, Columbia Univ., 1933.

53. Thorndike, E. L. The Measurement of Achievement in Drawing. Teachers Coll. Record, 1913, *14*, No. 5.
54. Tiebout, H. M., and Kirkpatrick, M. E. Psychiatric Factors in Stealing. Am. J. Orthopsychiat., 1932, *2*, 114–23.
55. Wirth, L. Culture Conflict and Misconduct. Soc. Forces, 1931, *9*, 484–92.
56. Yeppson, L. N. Measuring Social Adaptation. J. Juv. Res., 1928, *12*, 254–60.
57. Yeppson, L. N. A Study of Problem Boys and their Brothers. (N. Y.) Sub-Commission on Cause and Effect of Crime. 1929.

NOTES

I. *Points Proposed for the Extension of the Goodenough Scale.*

8ax. Hair shaded.

8ay. Hair formed.

9dx. This point is earned by a careful and clear representation of clothing detail, such as trouser cuff and crease, coat lapel, pockets, light shading, etc. It does not require the drawing of any specified number of articles of clothing, but depends rather upon the completeness of representation of those articles attempted. It will be given only in the case of a drawing clearly on a mature level.

11ax. Both elbow and shoulder joints indicated, each in a manner acceptable for G's point 11a—*i.e.*, 11a earned "twice."

11bx. G's point 11b earned with credit to spare. In profile: Buttocks show modeling and one of these: legs in true profile, or knee joint shown in some manner acceptable to G. (See her sample drawings, Fig. 29, 18, 39.) Full face: Hip must show modeling, and inner lines of legs meeting at point of junction with body. There are cases where by reason of the perfect trousering with crease the knee cannot be shown as modeled; but if the nature of the clothing is such as to show the knee, the knee must show modeling.

12x. "Perfect proportion": G's points 12a, b, c, d, e all earned.

14ax. Coördination intermediate between G's points 14a and 14b. If the drawing is poor in detail—*e.g.*, childishly simple circles or ellipses for head and trunk; clothing represented by buttons, etc.—scoring should be very strict as to firmness, lack of accidental wavering, and accuracy of line junctions. See fig. 40 in G. for example of success: fig. 31, 41, 52, 93 for failures. If the drawing shows greater complexity, and there seems genuine room for a consideration of G's point 14b, then this point may be given. See fig. 18, 30, 47, 55 in G. for examples of clear success; fig. 5, 20, 61 might be taken as the lower limit for this point. Erasures which are incomplete or which disturb other lines will probably cause this point to be lost, where otherwise there would certainly be success.

14fx. This point is earned when in considering point 14f (G.), there is found one imperfection: slight skewness, or one feature not in two dimensions.

14x. "Perfect coördination": G's points 14a, c, d, e, f all earned. Notice that her point 14b need not be passed; but 14ax must be passed.

15bx. The upper edge of the ear is in a line drawn through the center of the eyes (or through the outer edge of the eyebrows). See fig. 55 in G. for an example of failure.

16dx. The eyes, in a full face drawing, obviously glancing. There must be no convergence or divergence of the eyes, either horizontally or vertically.

18bx. This point is earned in those full face drawings, exclusive of mixed profiles, which show neither any error of attachment of limbs nor any transparency. Note: the legs must be correctly attached to the trunk, not separated as is allowable for G's points 5a and 5b; however, where clothing hides this junction, it will usually be safe to assume it to be acceptable.

II. *Abbreviated Key For the 51-Point Scale Developed by Goodenough.*

1. Head present.
2. Legs present, number correct.
3. Arms present, number correct. Fingers alone, insufficient. Credit if any space between base of fingers and part of body to which attached.

4a. Trunk present. Line only is enough. Where figure is 2-dimensional: if features appear in upper end of single figure, credit if they are confined to upper half; otherwise not unless a cross line indicates end of head.

4b. Trunk proportion. Must be 2-dimensional; measure at greatest length and at greatest breadth. Length greater than breadth.

4c. Shoulders present. Not joint indication, but broadening. Perfect square or rectangle minus; corners must be rounded. Where trunk is profile, expansion of chest to show.

5a. Attachment of limbs. All limbs attached to trunk at any point; arms to neck, or junction of head and trunk, if neck omitted. If trunk omitted, minus. If legs elsewhere than to trunk, minus, regardless of arms. If only one arm or one leg shown, score for that one. If both shown, one incorrectly attached, minus.

5b. Limbs at right points. Where 4c plus, strict. Still more strictly where 4c minus. Profiles: arms on median line of trunk, short distance below neck, point coinciding with chest expansion.

6a. Neck present. Any clear indication of head as distinct from trunk.

6b. Neck outline continuous with head, trunk, or both.

7a. Eyes present. Either one or two, full face or profile.

7b. Nose present. Mixed profiles with two noses score plus.

7c. Mouth present. Mixed profiles with two mouths score plus.

7d. Nose *and* mouth in 2 dimensions; two lips shown. Any 2-dim. figure approximating shape of nose; rough equilateral triangle OK if on its base. Circle, square, dot: minus. 2 dots minus here, plus for nostrils. Mouth: full-face must be 2-dim., with line for separation of lips. Profile, nose must be clear from both forehead and upper lip. Mouth shows clear modelling of two lips, or else line for mouth is continuous with outline of face. Profile more likely to score plus than full-face.

7e. Nostrils shown. Any clear method. 2 dots are plus for this and for 7b. Profile: if outline of nose extends inward upon upper lip, score plus.

8a. Hair shown.

8b. Hair on more than circumference of head. Better than a scribble. Outline of head not showing through.

9a. Clothing indicated. Row of buttons, or hat, or both. Single dot near center of trunk is navel, not button. Vertical or horizontal lines indicate striped material.

9b. At least two articles of clothing which conceal the parts meant to be covered. Hat perched on top, or row of buttons alone not credited.

9c. Entire drawing free from transparencies of any sort. Both sleeves and trousers must be shown.

9d. At least four articles. Hat, coat, shirt, collar, necktie, belt, suspenders, trousers, shoes. Shoes must show more than heel: laces, toe-cap, double line for sole, or other detail. Coat or shirt must show sleeves, pockets, lapels, or distinctive shading. Buttons alone, no score. Collar is not mere ''insert neck''; nor may lapels be scored for collar. Necktie often hard to see; look carefully.

9e. Costume complete. No incongruities. Must be complete in all essential details. Scoring strict. Hat always, if essential to costume, as in uniform. (Not needed with business suit.) Sleeves always. Either coat or acceptable substitute. Both collar and necktie, when ordinarily part of dress. Trousers must always be shown. Shoes always. See note, 9d.

10a. Fingers present. On both hands, if both hands present.

10b. Number correct. On both hands, if both are shown. If second hand partially and logically concealed, credit on base of clear hand, if no question as to number on that hand. Ruling is rigid; scoring strict.

10c. Detail correct. 2-dimensional. Length $>$ breadth. Angle $< 180°$. For both hands, if both shown.

10d. Opposition of thumb. Clear differentiation. Very strict. If one of lateral digits definitely shorter; if angle at least twice angle between others; if point of attachment distinctly nearer wrist. On both hands, if both are shown.

10e. Hand distinct from fingers or arm. Line drawn across at about wrist line is sufficient, without any enlargement; fingers, however, may not extend clear back to this line. Any differentiation, by shading or outline, of the part of the extremity at the base of the fingers, scores. If hands are concealed in pockets, or behind back, etc., credit 10abc, not 10de; unless upper part of hand shows from pocket.

11a. Arm joint. Elbow, shoulder, or both. If elbow, it must be abrupt bend, not curve, at about middle of arm. One arm sufficient. If shoulder, arm must hang approximately parallel to body axis, and must show curve at point of attachment to body indicative of shoulder. Where arm for good and logical reason does not hang at side, and where there is clear indication of shoulder joint, point may be credited. Strict, for there is marked tendency for arm to stand out from body. Indication of elbow, without appreciation of *joint,* no score.

11b. Leg joint. Hip, knee, or both. If knee: abrupt *bend* at about middle of leg. In high-grade drawings, narrowing of leg at this point; knee length trousers insufficient. Hip: if inner lines of legs meet at junction with body. Note: Credit given even when the angle is that of the trousers, the legs almost certainly not so joining; trousers NON-transparent.

12a. Head. Area not more than $\frac{1}{2}$ nor less than $\frac{1}{10}$ trunk area.

12b. Arms. As long as, or a little longer than, the trunk. Not to knee. Width of arms less than of trunk. Note: trunk extends to leg junction; if not shown, assume to be where buttocks curve starts; if long coat conceals, take $\frac{1}{2}$ distance shoulder to heel, & give 12c.

12c. Legs. As long as trunk; not more than twice as long. Width as for arms.

12d. Feet. Feet and legs in 2-dimensions. Feet not ''clubbed''; length less than $\frac{1}{3}$ more than $\frac{1}{10}$ total leg. In full-face, score plus for foot shown in perspective, *provided* foot separated somehow from rest of leg.

12e. Arms & legs in 2 dimensions, even if hands & feet are not.

13. Heel. Credit in full-face, if foot shown in perspective.

14a. Firmness of line. All lines reasonably firm, junctions clean as to overlap or gap. Consider complexity of drawing, in leniency. ''Sketchy'' drawing of many short lines credits.

14b. Firmness. In addition to 14a, if very strict interpretation of rules in 14a can still be passed.

14c. Head outline. Rather strict. No obviously unintentional irregularities. No circle or ellipse. Conscious control of movement of hand.

14d. Trunk outline. Ditto head.

14e. Arms & legs. No irregularities; no narrowing at top; both 2-dim.

14f. Features. Symmetrical in all respects. Eyes, nose, mouth, all in 2-dim. Full-face: Eyes equidistant from nose and from corners of mouth; two sides of mouth alike; mouth at right angles to axis of head. Nose symmetrical in shape, above center of mouth; if just 2 dots, must be equidistant from corners of mouth. Eyes correct position with respect to head outline. Profile: Eye regular in outline; distance center of eye to back of head at least twice distance to edge of nose. Nose forms obtuse angle with forehead; size proportionate to other features and to size of head. Mouth regular; size OK.

Note: this point is strict.

15a. Ears. Number correct. Be careful not to overlook.

15b. Correct position and proportion. Vertical meas. $>$ horizontal. In profile, some detail; at least dot for aural canal. Somewhere in middle two-thirds of head (Note: vertically only?), and shell-like portion extends backwards.

16a. Eye. Brow, lashes, or both. May show moulding of supra-orbital ridge.

16b. Pupil. Dot with curved line above represents eye, not pupil. Both eyes, if both shown.

16c. Proportion. Horizontal meas. > vertical. Both eyes, if both shown. In all profiles where eye is in perspective, credit.
16d. Glance. Profile only. Eye must be in perspective, or else pupil must be definitely forward of center. Strict.
17a. Both chin and forehead shown. Full-face: eyes and mouth both shown; sufficient space above eyes, below mouth; lenient. Profile: may omit eyes and mouth, if outline shows clearly limits of forehead and chin.
17b. Chin clearly differentiated from lower lip. Full-face only when modelling of chin is somehow indicated.
18a. Profile A. Head, trunk, feet all in profile, without error. Line of buttons, arms, necktie, or some other detail must show trunk profile. Only one of following to be tolerated:
  1. One bodily transparency, as trunk outline through arm.
  2. Legs not profile; at least upper part of leg in background must be concealed by the other.
  3. Arms attached at outline of back, extending *forward* (never backward).
18b. Profile B. True profile, no error nor transparency, except that shape of eye may be ignored.

III. *Characteristics of Boys Drawing Incongruously.*

Boys taken from D-group; data from case histories.

Boys whose drawings are certainly normal.

B. Father: policeman; died 7 yrs. before boy's first commitment.
Mother: attractive, intelligent, fine reputation.
Home: in second-rate tenement district, but clean.
Brother: in Juvenile Court.
Boy: only once in Court; obedient, truthful, courteous, trustworthy; listless manner, ''shut-in'' type; easily influenced.

G. Father: afraid of boy.
Mother: spoils boy; defends him against father.
Boy: disrespectful to parents; has defied father with axe. Clinic finds evidence of profound nervousness; questions schizophrenia; recommends psychiatric attention.

K. Father: ''queer,'' ''bewildered attitude''; few friends, never close to his boys; infrequently drunk.
Mother: left husband after 10 yrs.; died later.
Paternal grandmother: has spoiled boy.
Boy: bright, likeable, irresponsible, easily led.

R. Father: insincere; never keeps promises; ''anything goes if you can get away with it.''
Mother: pays no attention to children, but does not want them in trouble.
Boy: irritable, secretive, stays out late nights, ''answers back.''

T. Father: excitable, irritable, violent temper; leaves children to mother.
Mother: no affection for husband; over-protective toward boy; has Court record.
Boy: hunch-back; few permanent friends; feels self not liked at home; unhappy; stays away from home.

V. Father: a second time married; lives in ''immoral house.''
Mother: died when boy was baby.
Boy: stole in company of adult.

W. Father: quick-tempered; his boys ''all fight him''; formerly drank heavily; better since.
Mother: dead since boy was 10 years old—three years before boy's first commitment.
Home: in ''very poor location.''
Boy: never got along with family, friends, or police; thorough dislike for school, interest in woodwork.

Boys whose drawings are certainly incongruous.

A. Father: ''no good.''
Mother: in State Hospital for Insane; ''incurable.''
Boy: paroled 4 times; returned always for leaving home.

D. Home: ''in violent disorder, and dirty—reflects Mrs. D's emotional, distraught nature.''
Boy: restless, over-active, scatter-brained; dull.

F. Parents: drunkards, lazy.
Home: broken up by Court order; improved enough to bring children back; relapsed to first state.
Boy: poorly adjusted to school; persistent truant.

H. Parents and home: no data.
Boy: State Hospital for Insane, observing for 3 weeks, found no definite psychosis; gave diagnosis of ''psychopathic personality.'' Private farm school kept boy in solitary confinement most of the time, because ''moral pervert of worst sort.''

L. Mother: sexually loose; incurable paretic, committed.
Boy: pathological liar; psychiatrist ''throws up hands'' at mere mention of boy.

W. Father: invalid; no control over boy.
Mother: ''emotionally unstable''; shields children.
Boy: behavior problem in school; truant; dull.

Boys taken from N.Y.C.C.H.; data from case histories.

Boys whose drawings are certainly incongruous.

B. Slow, dull, cries at examination. Depressed, inert, apathetic. Poor attention control. Obsessed with thought of lost sister. Disobedient. Demoralizing to others when dissatisfied with work assignment.

B2. Abandoned at one year. Parents morally and mentally low; heavy drinkers. Poor concentration; destructive unless interested in a specific task.

C. Parents unknown. Timid; at times withdrawn. Over-active and fidgety. Attention very variable. Extremely impulsive, gives up easily. Resentful. Disobedient.

E. Dull and unmanageable; inclined to be over-active, boisterous. Judgment defective. Annoyed when conscious of failure. Quarrelsome with children below his age.

E2. Non-psychotic epileptic; denies hallucinations. Troublesome to others on ward; violent at times of seizure.

P. Mother unknown, father deserted. Dull, slow; indifferent; dishonest; given to striking children without reason. For 2-yr. period shook head almost constantly; symptom gradually disappeared. Neat, orderly, easily disciplined. Happy with foster father.

S. Mother describes boy as ''nervous, easily excited; does not make friends easily.'' Father dead; was nervous; cancer. Boy's history negative except: ''wanders unless always watched.''

Boys from PS_{res}; comments from several teachers, (1, 2, etc.).

Boys whose drawings are certainly incongruous.

F. 1. Exasperating; could do exceptionally well—*if* he chose. Nervous and rattle-headed. Noisy "show-off" who will try to "get away with as much as he can"; not a sneak.

2. A "movie-crazy show-off" with a bad case of Wild West. Takes discipline well, but likely to be impulsive. Would like to have responsibility, but is irresponsible.

3. A "show-off" who asks for responsibility but can not carry it. Will never settle academic or disciplinary difficulties on his own responsibility, but must be forced to the very end.

4. "Crazy kid!" Talks too much; lacks judgment.

5. Wants to run things. Has offensive manner ("chip on shoulder") which may come from needing a great deal of attention following very unsatisfactory home life; has lived away a great deal.

6. "Does not know what cooperation is; will create disturbances in a most thoughtless way (and repeatedly) and then be most affable in trying to explain them away." Neither mean nor childish, but a thorough "pest."

H. 1. Nervous and untidy to an extreme. Very immature. Tries hard, but is weak in his work. As a citizen, he is a good sport, and honest.

2. Works "in streaks"; works for marks; cheats to make up for lack of ability in class work.

3. Thinks he can do as he pleases; and does so without restraint. Gets along with boys older than himself.

4. Excites sympathy, because he is so "dumb" and yet such a good sport. "Stifled by his own embarrassment"; cannot seem to speak his mind.

5. Poor boy! So inoffensive and unobtrusive one would never know he was around. Needs some one who could really be interested in him. Extremely sensitive about his financial inferiority.

H2. 1. Overly quiet, even withdrawn. A good sport, but falls a little short of being a "boy's boy." Very conscientious. Not a leader, but not rejected by the boys.

2. Outstandingly honest and earnest—to the point of being an object of amusement to the adult onlooker.

3. "Oh dear! H . . . .!" Very good, very pleasant, but so very stupid! Tries very hard, but thoughts are "fuzzy," not coherent. Out for all the culture he can get; Culture with a big C.

4. Slow, but out to get the most from his opportunities. Withdrawn rather than outgoing in temperament. Thoroughly reliable boy, with very mature social attitudes.

5. Earnest, thorough, dependable, more mature than the group. Inclined to work by himself, though not necessarily withdrawn. Going to get from school all that he can; good work.

H2. 6. No problem except his low ability; does his very best. Tries so hard to "broaden himself" that one suspects a consciousness of inferiority. Very nervous when addressing class, but very pleased at finding that he could hold their attention.

7. Very quiet and dependable, with good attitudes.

P. 1. A very trying child, but a nice one. Likely to be stubborn unless he is given considerable attention. He and his sibs are all guilty of: "Oh, I can't do that," "I don't understand," etc.

2. Probably brilliant; extremely able and willing if interested. Sullen when crossed. More interested in self than in group. A poor sport, not at all willing to accept blame.

3. May be a cheat (not sure of it). Nothing outstanding.

4. Very resourceful and capable out-of-doors; too quiet to mix well. Most uneven in development, with whining, babyish manner.

5. Whines; decidedly not cheerful. Will not take his share of work; cheats; gets what he can for nothing in all phases of school life. Standards have not been built up.

AN APPENDIX
of
ILLUSTRATIVE MATERIAL

Tables
Diagrams -
Sample Drawings
Scoring of Extension Points

Sample Drawings Photographed from Originals

Details for Extension Scoring
Taken from
Tracings

Table I

Parents' Occupations for PScong

Store clerk or small shop owner						10
Domestic service						5
Trades						21
Baker	2	Machinist	3	Seamstress	1	
Barber	1	Mason	1	Shoe repair	2	
Carpenter	3	Painter	1	Upholsterer	1	
Electrician	1	Plumber	3	Weaver	2	
Unskilled labor						6
Boat hand	1	Janitor	2	Mill hand	1	
Dock foreman	1	Laborer	1			
Miscellaneous low wage						4
RR employee	1	RR fireman	1	Meat cutter	1	
		Telegraph operator	1			
Miscellaneous						9
Lighthouse	1	Nurseryman	1	Salesman	1	
Unemployed	2	Occupation unknown	4			
						55

Table II

Reliabilities of Drwg Scores by "Split-Scale", Corrected for Full Length by Spearman-Brown Formula

Group	Age Range Below 12-0 ρ	 N	 12-0 to 14-5 ρ	 N	 Above 14-5 r	 N	 All Ages r	 N	Score
Delinq	.56	8	.77	17	.85	35	.88	60	Orig
PSres	.38	11	.84	17	.85	32	.85	60	
PStrade					.87	60	.87	60	
Delinq	.64	8	.79	17	.88	35	.87	60	Lim Ext
PSres	.36	11	.86	17	.88	32	.89	60	
PStrade					.89	60	.89	60	
Delinq	.64	8	.80	17	.86	35	.86	60	Rev
PSres	.87	11	.83	17	.88	32	.90	60	
PStrade					.91	60	.91	60	

Table III

Variability of Drawing Scores at Different Age Levels

	Orig. Scoring Mean	 S.D.	Scoring by Lim. Ext. Mean	 S.D.
Goodenough's 8-yr-olds	20.3	6.2		
" 10 " "	26.2	7.6		
" 8 " " (N-group)	22.5	5.4		
" 10 " " (" ")	30.6	6.6		
Cohen's 13-yr-olds	33.7	6.9		
# # #				
Total PS, 14-6 to 15-5	34.4	5.7	37.2	6.6
" " 15-6 " 16-5	36.5	5.6	39.5	7.2
" " 16-6 " 17-5	33.9	7.2	36.6	8.8
" " 17-6 " 18-5	36.6	8.3	39.0	9.6
" " over 14-5	35.8	6.7	38.0	7.8
PScong	35.4	7.0	37.5	6.9
PStrade	35.3	6.4	37.3	7.5
PSres over 14-5	36.9	6.8	39.5	8.3
PSres Grades	27.0	5.8	28.0	6.7
" Jr HS	35.8	6.0	38.5	7.4
" Sr HS	37.6	7.5	40.1	9.0

Tables I II III

Table IV

The Various Coefficients of Correlation of This Study

Furfey Scale vs Drawing and Chronological Age

PSres	Sr HS	Drwg, Rev. Score	vs	Devel. Age	.16 ± .12 PE
"	" "	" " "	"	Furfey Score	.17 ± .12
"	Jr HS	" " "	"	" "	.19 ± .09
"	Grades 4,5,6	" " "	"	" "	.16 ± .12
"	Whole School	" " "	"	" "	.45 ± .05
"	" "	Chronological Age "	"	" "	.66 ± .04 (note)
PScong	(HS)	Drwg, Rev. Score	vs	" "	.11 ± .08
"	""	" Orig. "	"	" "	.09 ± .08
Delinq	All Ages	" Lim Ext "	"	" "	.35 ± .09

NOTE: The r of .66 for PSres is raised to .71 if one case (C.A. 18 yrs, D.A. 8 yrs) is dropped. Correlation of Furfey vs Drwg not hurt by this boy, for both scores are very low.

Drawing Score vs Intelligence and Chronological Age

PSres	Whole School	Drwg, Lim Ext	vs	M.A.(Lang)	.60 ± .04
"	Grades 4,5,6	" " "	"	" " "	.42 ± .10
"	Whole School	" " "	"	C.A.	.53 ± .05
Delinq	Previous Sample	" Orig Score	"	M.A.(Maze)	.21 ± ?
"	" "	" " "	"	" " (P.C.II)	.13 ± ?
"	" "	" " "	"	" " (Compos.)	.60 ± .04
"	Present Study All Ages	" " "	"	" " (Lang)	.50 ± .08
"	" " "	" " "	"	" " (Non-L)	.39 ± .09
"	" " "	" " "	"	C.A.	.35 ± .09

Drawing Score (Original) vs Pintner Non-L. Sub-tests

Delinq	Present Study All Ages	Drwg	vs	Test I, score	.22 ± .10 (ρ)
"	" " "	"	"	" II "	.04 ± .11 (ρ)
"	" " "	"	"	" III "	.24 ± .10 (ρ)
"	" " "	"	"	" IV "	.58 ± .05 (ρ)
"	" " "	"	"	" V "	.48 ± .06 (ρ)
"	" " "	"	"	" VI "	.36 ± .09 (ρ)

Table V

Distributions of Goodenough and Extension Scores for Drawings of Various Entire Groups

Score	Delinq under 14-6			Delinq over 14-5			P.S.res Grades			P.S.res Jr HS			P.S.res Sr HS			P.S.res over 14-5			P.S.cong			P.S.trade			Total P.S. over 14-5		
	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev	Or	L E	Rev
16-18	4	4	4	4	3	3	4	4	4																		
19-21	3	3	3	4	5	4	3	2	2	1			1	1	1	1	1	1	3	2	2				4	3	3
22-24	5	3	3	3	3	4	5	5	5	1	2	1	2	2	2	2	2	3	1	2	2	5	3	3	8	7	8
25-27	8	10	10	7	4	4	7	7	6	3	2	3	1	1	1	2	2	1	3	0	0	4	5	5	9	7	6
28-30	3	2	1	2	5	4	4	5	6	5	5	5	3	2	2	6	4	3	4	7	6	8	6	6	18	17	15
31-33	8	7	6	9	3	3	6	2	2	7	3	2	3	3	3	5	5	4	16	7	6	10	11	10	31	23	20
34-36	1	3	5	4	7	7	3	4	4	6	5	5	5	2	2	9	3	4	5	10	11	12	5	5	26	18	20
37-39				9	7	5	1	3	3	10	9	7	5	5	5	8	9	8	10	7	4	10	12	10	28	28	22
40-42	1			4	5	7		1	1	7	7	9	8	5	3	11	8	5	4	8	12	9	8	9	24	24	26
43-45	1	1	1	1	5	4				4	3	3	2	3	4	3	4	7	6	4	1	3	7	6	12	15	14
46-48		1				2				1	6	4	3	6	4	3	9	7	1	4	4	4	2	3	8	15	14
49-51			1								2	3	2	2	3	2	2	3	2	1	3		5	4	4	8	10
52-54											1	2		2	2		2	2		2	1		1	3		5	6
55-57												1		1	2		1	3		1	2			1		2	5
58-60															1			1			1						2
N	34			47			33			45			35			52			55			65			172		
Mean																											
Orig	27.4			31.0			27.0			35.8			37.6			36.9			35.4			35.3			35.8		
Lim Ext	28.0			32.4			28.0			38.5			40.1			39.5			37.5			37.3			38.0		
Rev	28.4			33.1			28.1			40.0			41.1			40.9			38.4			38.0			39.0		
S.D.																											
Orig	6.34			7.60			5.80			6.00			7.49			6.82			6.95			6.39			6.74		
Lim Ext	7.00			8.34			6.65			7.40			8.98			8.25			7.87			7.50			7.70		
Rev	7.41			8.55			6.65			7.96			9.84			9.24			8.64			8.20			8.62		
SDavg																											
Orig	1.09			1.11			1.01			0.90			1.27			0.95			0.94			0.79			0.51		
Lim Ext	1.20			1.22			1.16			1.10			1.52			1.15			1.06			0.93			0.59		
Rev	1.27			1.25			1.16			1.19			1.66			1.28			1.17			1.02			0.66		

Table VIa

Various Total Groups Compared for Various Functions

	Delinq under 14-6	Delinq over 14-5	P.S.res Grades	P.S.res Jr HS	P.S.res Sr HS
Mean C.A.	13 yrs	16 yrs	11 yrs	14 yrs	17 yrs
" M.A.(Lang)	12 "	14½ "	12 "	15 "	17 "
Median IQ (")	93	96	106.5	109.5	116.7
" "" (PNL)	98.5	102	--	--	--
" Furfey Score	120	144	100	142	155
" " Age	13½ yrs	15 yrs	11½ yrs	15 yrs	16 yrs
No. of Cases	34	47	33	45	35

	P.S.res over 14-5	P.S.cong	P.S.trade	Total P.S. over 14-5
Mean C.A.	16 yrs	16 yrs	16½ yrs	16½ yrs
" M.A.(Lang)	16 "	16 "	15 "	16 "
Median IQ (")	111.5	109	99	109
" "" (PNL)	--	108.5	106.8	--
" Furfey Score	157	157	158	157
" " Age	16 yrs	16 yrs	16 yrs	16 yrs
No. of Cases	52	55	65	172
	#	#	#	

Median Values of Various Functions for Two State Home Groups

I Conduct & Adjustment OK. II Cond. or Adj. not OK.

	C.A.	M.A.	IQ	Drwg,Orig	Drwg,Rev	N
I	13 yrs-9mos	12 yrs-1 mo	92	31.2	31.2	14
II	13 " -6 "	12 " -4 "	90	30.0	30.2	26

Table VIb

Reliability of Differences between Group Mean Drawing Scores

Groups Compared	By Original		By Lim Ext		By Revision	
	Diff	Diff / SDdiff	Diff	Diff / SDdiff	Diff	Diff / SDdiff
D. over 14-5 vs D. under 14-6	3.6	2.3	4.4	2.6	4.7	2.6
PSres Grades vs JR HS	9.8	6.5	10.5	6.6	11.9	7.2
" Jr HS " Sr HS	1.8	1.2	1.6	0.9	1.1	0.5
" Grades vs D. under 14-6	0.4	0.3	0.0	0.0	0.3	0.2
" Jr HS " " " "	8.4	6.0	10.5	6.5	11.6	6.7
" " " " D. over 14-5	4.8	3.4	6.1	3.7	6.9	4.0
" over 14-5 vs D. over 14-5	5.9	4.0	7.1	4.2	7.8	4.4
PScong " " " "	4.4	3.0	5.1	3.2	5.3	3.1
PStrade " " " "	4.3	3.2	4.9	3.2	4.9	3.0
Total PSover " " " "	4.8	3.9	5.6	4.1	5.9	4.2
PSres over 14-5 vs PScong	1.5	1.1	2.0	1.3	2.5	1.4
" " " " PStrade	1.6	1.3	2.2	1.5	2.9	1.8
PScong vs PStrade	0.1	0.1	0.2	0.1	0.4	0.3
Total PSover vs PSres over 14-5	1.1	1.0	1.5	1.2	1.9	1.3
" " " PScong	0.4	0.4	0.5	0.4	0.6	0.4
" " " PStrade	0.5	0.5	0.7	0.7	1.0	0.8
Orig. vs Ext. Scores for D. under 14-6			0.6	0.4	1.0	0.6
" " " " " D. over 14-5			1.4	0.9	2.1	1.3
" " " " " PSres Grades			1.0	0.7	1.1	0.7
" " " " " " Jr HS			2.7	1.9	4.2	2.8
" " " " " " Sr HS			2.5	1.3	3.5	1.7
" " " " " " over 14-5			2.6	1.7	4.0	2.5
" " " " " PScong			2.1	1.5	3.0	2.0
" " " " " PStrade			2.0	1.6	2.7	2.1
" " " " " Total PSover 14-5			2.2	2.8	3.2	3.8

Table VIc

A Table Showing the Differences between Various Groups in Drawing Score, C.A., M.A., and Furfey D.A.

	Drawing Score		C.A.	M.A.	Furfey D.A.
	Orig	Lim Ext			
D_{under} 14-6	27.4	28.0	13 yrs	12 yrs	13½ yrs
PS_{res} Grades	27.0	28.0	11	12	11½
D_{over} 14-5	31.0	32.4	16	14½	15
PS_{res} Jr HS	35.8	38.5	14	15	15
PS_{res} Sr HS	37.6	40.1	17	17	16
PS_{res} over 14-5	36.9	39.5	16	16	16
PS_{cong}	35.4	37.5	16	16	16
PS_{trade}	35.3	37.3	16½	15	16
Total PS_{over} 14-5	35.8	38.0	16½	16	16

D_{over} 14-5	31.0	32.4	16	14½	15
PS_{res} Jr HS	35.8	38.5	14	15	15
PS_{trade}	35.3	37.3	16½	15	16

Diagram Accompanying Table VII

Median Drawing Scores of Various Groups at Various I.Q.-Levels.

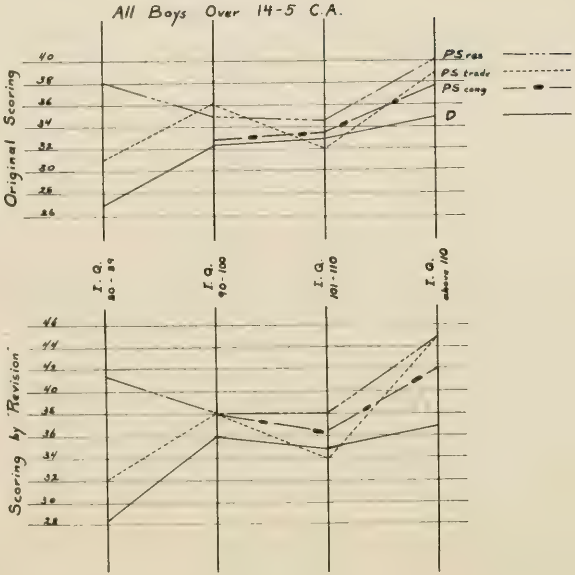


Table VII

Drawing Performance of Various Groups at Various IQ Levels

--- All Boys Over 14-5 C.A.---

Lang IQ Range	No. of Cases	Language IQ's Mdn	Language IQ's Mid 50%	Drawing Scores: Original Mdn	Original Mid 50%	Revised Mdn	Revised Mid 50%	School
111 &	27	119	114-122	40	35-42	45	37-50	PS$_{res}$
above	24	114	113-118	37.5	32-41	42	33-47	PS$_{cong}$
	15	114	113-116	39	37-41	45	41-49	PS$_{trade}$
	9	119	117-120	35	31-38	37	34-40	Delinq
101-	20	107	105-108	34.5	31-33	38	34-43	PS$_{res}$
110	20	105	103-108	33.5	32-37	36.5	34-42	PS$_{cong}$
	11	104	103-108	32	32-36	34	33-38	PS$_{trade}$
	9	105	103-107	33	28-36	35	31-38	D.
90-	5	100	96-100	35		38		PS$_{res}$
100	7	98	94-100	33		38		PS$_{cong}$
	22	97.5	96-100	36	30-40	38	31-44	PS$_{trade}$
	16	95	94-98	32.5	26-37	36	27-41	D.
80-	2		both 88		37&39		40&43	PS$_{res}$
89	0							PS$_{cong}$
	17	83	81-86	31	27-34	32	28-36	PS$_{trade}$
	20	86	82-88	27	22-32	28.5	22-36	D.

Diagram Accompanying Table VIIIa

Goodenough Scores In Matched Groups

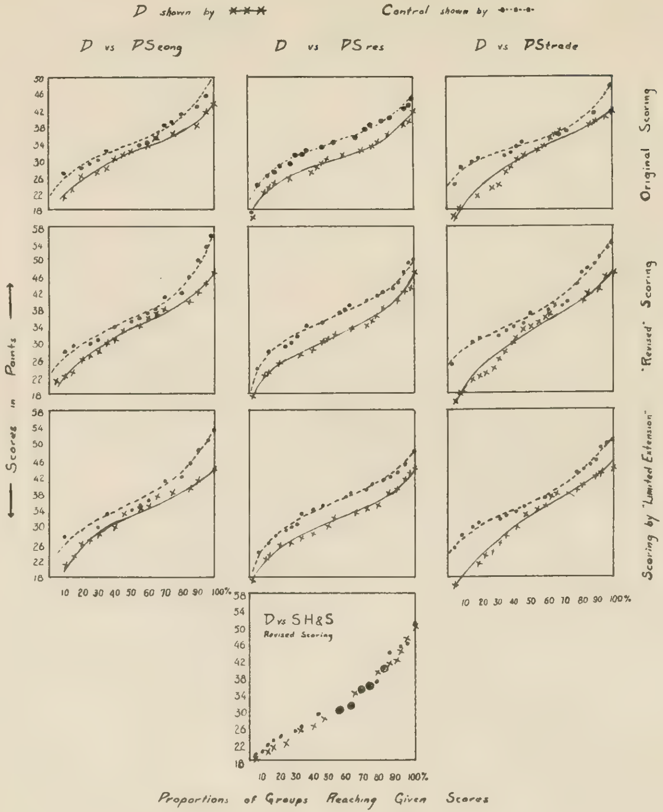


Table VIIIa

Comparative Data for Matched Comparison Groups

	D	PS$_{res}$	D	PS$_{cong}$	D	PS$_{trade}$	D	SH&S
Mdn. M.A.	15-2	15-2	16-0	15-6	15-0	14-10	12-4	12-8
" C.A.	15-1	15-1	15-11	15-11	16-3	15-1	14-3	14-4
" I.Q.	104	104.5	107.5	107	100	99	90	91
Furfey D.Q.	100.7	104	97.5	101	94	101.5	100	-
Non-L M.A.	-	-	15-2	16-2	14-10	16-1	-	-
" " I.Q.	-	-	101	107.5	99.5	108.3	-	-
Orig. Score	31.2	34.8	33.	33.8	32.5	36.2	29	29.8
Lim Ext "	32.5	37.4	34.5	35.	34.5	37.3	30.3	30.7
Revised "	32.5	37.5	34.5	36.	35.	38.	30.5	30.7
Typical (N)	29%	81%	40%	75%	50%	88%)	WEH, Judge	
A-typ. (Y)	71%	19%	60%	25%	50%	12%)		
(N)	64%	87%	70%	85%	65%	96%)	LEP, Judge	
(Y)	36%	13%	30%	15%	35%	4%)		
No. of Pairs	31		20		26		26	

Distributions of the Three Drawing Scores

	By Original								By Lim. Ext.							
Score	D	PS	D	PS	D	PS	D	SH	D	PS	D	PS	D	PS	D	SH
15-19	1	1	-	-	2	-	1	1	1	1	-	-	2	-	1	1
20-24	4	1	3	-	5	1	6	4	3	1	3	-	5	-	5	4
25-29	9	6	4	5	3	3	7	9	3	5	3	4	2	2	6	6
30-34	10	8	5	7	5	8	5	4	10	5	5	6	5	9	5	5
35-39	6	9	6	3	8	7	4	3	6	10	6	3	6	3	4	5
40-44	1	5	2	3	3	4	3	5	3	6	3	3	6	2	4	3
45-49	-	1	-	1	-	3	-	-	-	3	-	2	-	3	1	2
50-54	-	-	-	1	-	-	-	-	-	-	-	2	-	2	-	-
	res		cong		trade		SH&S		res		cong		trade		SH&S	

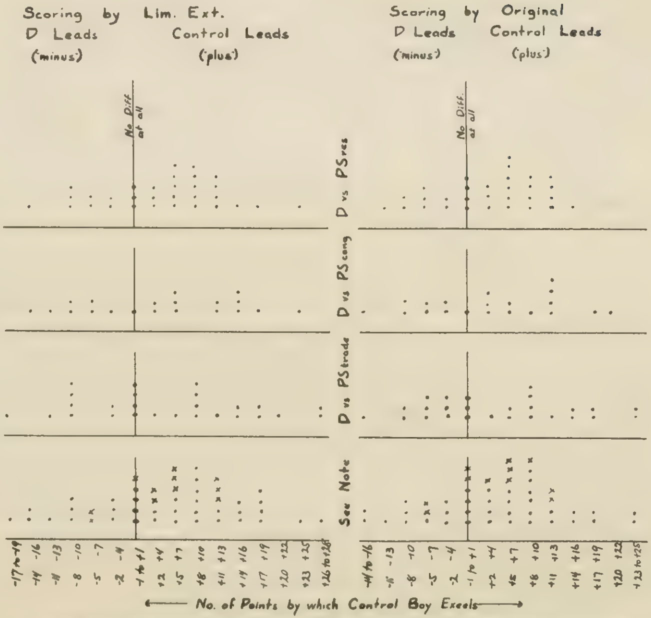
	By Revision							
Score	D	PS$_r$	D	PS$_c$	D	PS$_t$	D	SH
15-19	1	1	-	-	2	-	1	1
20-24	3	1	3	-	5	-	5	4
25-29	8	5	3	3	2	1	6	6
30-34	10	4	5	5	4	9	5	5
35-39	3	8	3	5	4	8	3	4
40-44	5	9	5	3	7	2	4	2
45-49	1	2	1	1	2	3	1	[illegible]
50-54	-	1	-	2	-	3	1	1
55-59	-	-	-	1	-	-	-	-

Table VIIIa

Diagram accompanying Table VIII b

Matched Comparison Groups – Summary Diagrams
Quantitative Differences

Distributions of Drawing Score Differences For Individually Matched Pairs
(Control Boy's Score minus the Delinquent's)



Note: Bottom distribution is for 36 Pairs over 14·5 CA (plus 11 Pairs under 14-6), in which no D boy appears twice — see text.

Table VIIIb

Comparisons of Matched Pairs of Boys

	PSres over 14-5 vs D over					PScong vs D				
	Drawing Orig Points	Drawing L.E. Points	IQ	CA Mos.	Fur-fey Pts.	Drawing Orig Points	Drawing L.E. Points	IQ	CA Mos.	Fur-fey Pts.
Total Pos. Diffs.	+114	+130	+12	+76	+322	+115	+134	+7	+35	+236
" Neg. Diffs.	-41	-49	-9	-39	-175	-51	-60	-18	-22	-94
Number Positive	14 +	14 +	6 +	9 +	10 +	12 +	12 +	6 +	12 +	8 +
" Negative	6 -	6 -	6 -	10-	4 -	7 -	7 -	10-	7 -	5 -
" Zero Diff.			8	1		1	1	4	1	
Avg. Pos. Diff.	+8.2	+9.3				+9.6	+11.2			
" Neg. "	-6.8	-8.2				-7.3	-8.6			
Average Difference	7.8	9.0				8.3	9.7			
Net Diff. (Avg.)	+3.7	+4.1	+.2	+2.	+11.	+3.2	+3.7	-.6	+.7	+11.

	PStrade vs D					PSres vs D (N = 31)				
	Drawing Orig Points	Drawing L.E. Points	IQ	CA Mos.	Fur-fey Pts.	Drawing Orig Points	Drawing L.E. Points	IQ	CA Mos.	Fur-fey Pts.
Total Pos. Diffs.	+177	+199	+6	+60	+388	+170	+193	+32	+83	+428
" Neg. "	-60	-76	-20	-31	-81	-51	-59	-15	-61	-216
Number Positive	14 +	14 +	4 +	11+	15 +	22 +	22 +	12+	11+	16 +
" Negative	12 -	12 -	15-	13-	4 -	8 -	8 -	9-	13-	7 -
" Zero Diff.			7	2		1	1	10	2	
Avg. Pos. Diff.	+12.6	+14.2				+7.7	+8.8			
" Neg. "	-5.0	-6.3				-6.4	-7.4			
Average Difference	9.1	10.6				7.1	8.1			
Net Diff. (Avg.)	+4.5	+4.7	-.5	+1.	+16.	+3.8	+4.3	+.5	+.7	+9.

Note: A plus sign (+) denotes superiority of Control
A minus (-) " " " Delinquent

Table VIIIc

Matched Comparison Groups

Interpretation of Ogive Curves of Diagram Opposite Table IXa

A. No. of Points by which Control leads Delinq. at Key Points

	Scoring by Original			Scoring by Lim. Ext.		
Key Point	D vs PSres	D vs PScong	D vs PStrade	D vs PSres	D vs PScong	D vs PStrade
10%-ile	4 pts	4 pts	9 pts	3½ pts	6 pts	9 pts
25%	4	4	6	4	4	7
50%	4	2	2½	4	3½	3½
75%	4	3	2	5	4	3
90%-ile	4	5	4	5	8	4½
Avg ..	4 ..	3.6 ..	4.7	4.3 ..	5.1 ..	5.4 ..

B. %-ile Leads of Control over Delinq. at Key Points. Data from the three Matched Groups lumped.

Note: In the following tables, column I shows the proportions of the "Avg'd Control Groups" which exceed given drawing scores; column II shows the (smaller) proportions of the delinquent group exceeding those same scores; column III, made up of the differences between I and II, indicates the %-ile lead of the Control over the Delinquent Group.

Scoring by Original			Scoring by Lim. Ext.		
I	II	III	I	II	III
100%	88%	12%	100%	90%	10%
90	75	15	89	75	14
68	50	18	66	50	16
42	25	17	44	25	19
11	0	11	13	0	13
		14.6%	Average Lead	....	14.4%

Table VIIId

Behavior of M.A. when C.A. and Drawing Score Are Controlled.

In Contrast to Behavior of Drawing Score when C.A. and M.A. Are Controlled.

	Total Groups (See Table VIIa)		Groups Matched for:			
			C.A.-only		C.A. & Drwg.	
	mean C.A.	mean M.A.	mean C.A.	mean M.A.	mean C.A.	mean M.A.
D over 14-5	16 yrs	14½ yrs	15-11	14-6	15-11	15-2
PStrade	16½ yrs	15 yrs	15-11	14-9	16-0	14-4
			N = 19		N = 22	
D over 14-5	16 yrs	14½ yrs	15-10	14-9	15-10	14-11
PS (res over 14-5 / (cong	(16)	(16)	15-10	16-8	15-10	16-4
			N = 30		N = 33	
PSres over 14-5	16 yrs	16 yrs				
PScong	16 yrs	16 yrs				

Matched for C.A., only	D vs PStrade		D vs PShigh schools	
No. of pairs D-boy leads in M.A.	9	10:11	4	10:65
" " " Control " " " "	10		26	

Matched for C.A. and Drwg Score				
No. of pairs D-boy leads in M.A.	13	10:7	8	10:32
" " " Control " " " "	9		25	

Table IX

Frequency of Occurrence of A-typical Drawings in Various Total Groups

Expressed in terms of percentage

W.E.H. as Judge	No %	No? %	Yes? %	Yes %	N %	Y %
Delinq. below 14-6	18	15	33	33	33	66
" above 14-5	26	26	30	19	51	49
PStrade	62	24	6	8	86	14
PS cong	65	17	8	11	82	19
PSres Jr HS	55	31	8	6	86	14
PSres Sr HS	63	20	14	3	83	17
State Home	36	32	23	9	68	32
L.E.P. as Judge						
Delinq. below 14-6	32	12	40	16	44	56
" above 14-5	56	14	17	14	70	31
PStrade	47	38	6	8	85	14
PScong	65	18	8	9	83	17
State Home	67	17	14	2	84	16
L.M.K. as Judge						
Delinq. below 14-6	12	24	28	36	36	64
" above 14-5	31	31	19	19	62	38
PStrade	51	19	19	10	70	29

Table Xa

Characterization in Drawings
(Various Total Groups)

Character	Delinquents		PSres				Other P.S.	
	below 14-6	over 14-5	Grades	Jr HS	Sr HS	over 14-5	P.S. cong	P.S. trade
Cowboy	27%	14%	8%	2%		2%	6%	7%
Soldier, Sailor	13%	14%	20%	21%		9%		9%
Other Adventure	7%		12%	5%	4%	5%	2%	
Total Adventure	47%	27%	40%	28%	4%	16%	7%	17%
Humorous				2%		2%	7%	2%
Athletic		2%		9%			6%	6%
Civilian	27%	47%	52%	35%	57%	43%	56%	54%
Collegiate	13%	10%	4%	9%	25%	23%	17%	9%
Total Civilian	40%	57%	56%	43%	82%	66%	72%	63%
Miscellaneous	13%	10%	4%	16%	14%	16%	7%	13%
N	15_{34}	30_{43}	25_{36}	43_{51}	28_{36}	44_{53}	54_{65}	54_{77}
Stereotype	56%	30%	31%	16%	22%	17%	17%	30%

Table Xb

Characterization in Drawings
(Various Matched Groups)

Character	PStrade	D-Group	PScong	D-Group	PSres	D-Group
Cowboy	15%	22%	7%	14%	8%	17%
Soldier, Sailor	10%	17%		14%	23%	9%
Other Adventure						9%
Total Adventure	25%	39%	7%	29%	31%	35%
Humorous			14%			4%
Athletic		11%	14%	14%		4%
Civilian	45%	33%	57%	36%	42%	39%
Collegiate	15%	6%		7%	12%	9%
Total Civilian	60%	39%	57%	43%	54%	48%
Miscellaneous	15%	11%	7%	14%	15%	9%
N	20_{26}	18_{26}	14_{20}	14_{20}	26_{31}	23_{31}
Stereotype	23%	31%	30%	30%	16%	26%

Table XIa

Degree of Perfection in Concept of Motion or Posture
(Various Total Groups)

		Delinquents		PSres					
		below 14-6	above 14-5	Grades	Jr HS	Sr HS	above 14-5	PS Cong	PS Trade
1. First Degree:	Stereotype	29%	17%	8%	6%	5%	3%	8%	13%
	1st	29%	17%	8%	6%	5%	3%	8%	13%
2a. Second "	Incomplete	25%	14	36	12	6	9	16	26
	Stiff	29%	28	28	33	46	39	27	25
	2nd	54%	42	64	45	52	48	43	50
3a. Third "	Complete	6%	15	18	13	8	10	12	13
	Some Life	11%	25	10	36	37	40	39	26
	3rd	17%	40	28	49	45	50	50	38
2b. Motion	Incomplete	25%	14	36	12	6	9	16	26
	Complete	6%	15	18	13	8	10	12	13
	Motion	31%	29	54	25	14	19	27	38
3b. Posture	Stiff	29%	28	28	33	46	39	27	25
	Some Life	11%	25	10	36	37	40	39	26
	Posture	40%	53	38	69	83	79	66	50

Table XIb

Degree of Perfection in Concept of Motion or Posture
(Various Matched Groups)

		D. vs PScong		D. vs PSres		D. vs PStrade	
1. First Degree:	Stereotype	13%	5%	19%	5%	20%	10%
	1st	13%	5%	19%	5%	20%	10%
2a. Second "	Incomplete	13	20	23	19	17	27
	Stiff	33	30	32	37	21	19
	2nd	45	50	55	56	38	46
3a. Third "	Complete	15	15	10	16	21	4
	Some Life	28	30	16	23	21	40
	3rd	43	45	26	39	42	44
2b. Motion	Incomplete	13	20	23	19	17	27
	Complete	15	15	10	16	21	4
	Motion	28	35	32	35	38	31
3b. Posture	Stiff	33	30	32	37	21	19
	Some Life	28	30	16	23	21	40
	Posture	60	60	48	60	42	59

Note: Proportions are as found by averaging results of two lay judges acting to-gether and of author acting alone.

DEPARTMENT OF PSYCHOLOGY
LIBRARY

Diagram 1

Drawing Scores as Influenced by Merit of Drawings

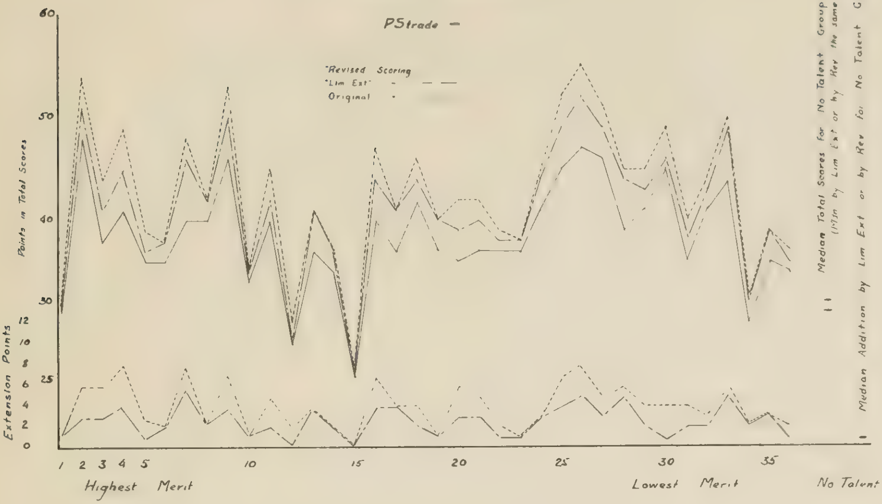


Diagram 2

Drawing Scores as Influenced by Merit of Drawings

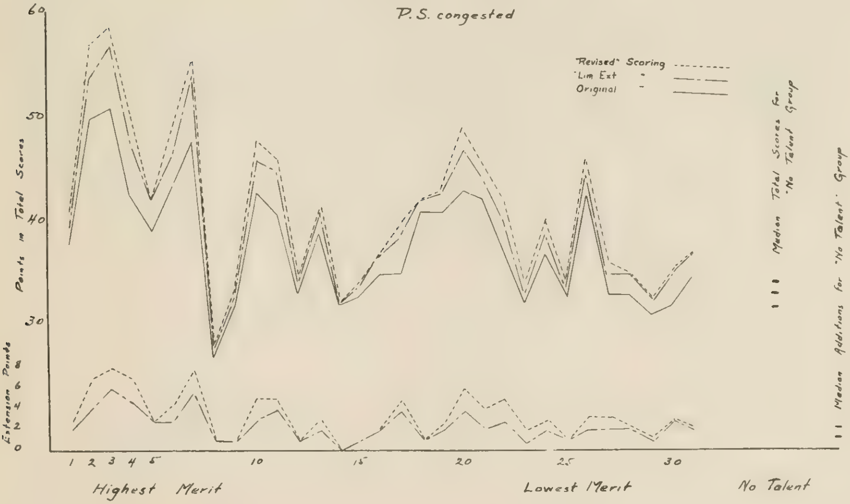


Diagram 3

Drawing Scores as Influenced by Merit of Drawings

College Men & Women (Material from Dyett)

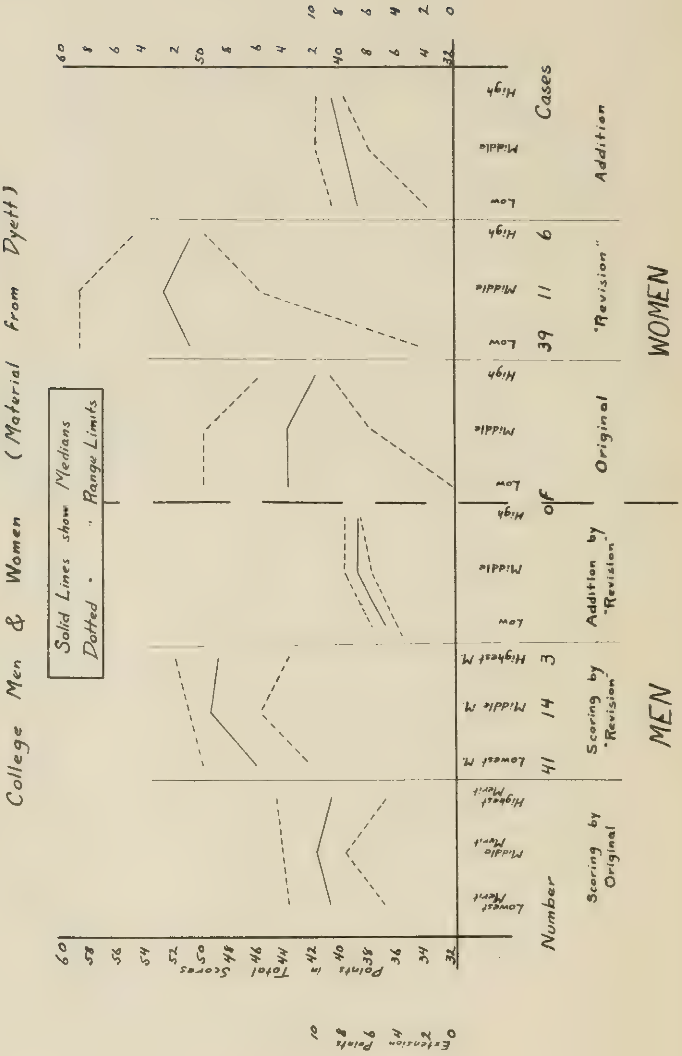


Diagram 4

Extension Points — Percent Passing at each M.A.

Data from PSres & from PScong Combined

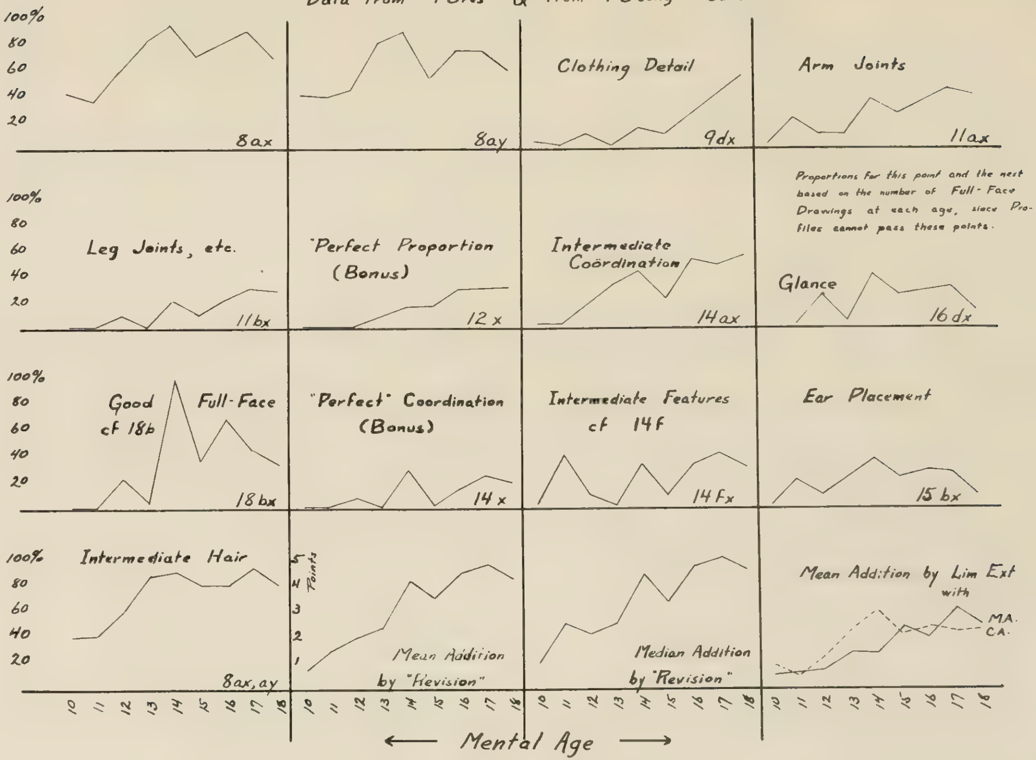


Diagram 5

Effect of Drawing Score Revision on Drawing Score Distributions

(Spreading of High End of Distribution)

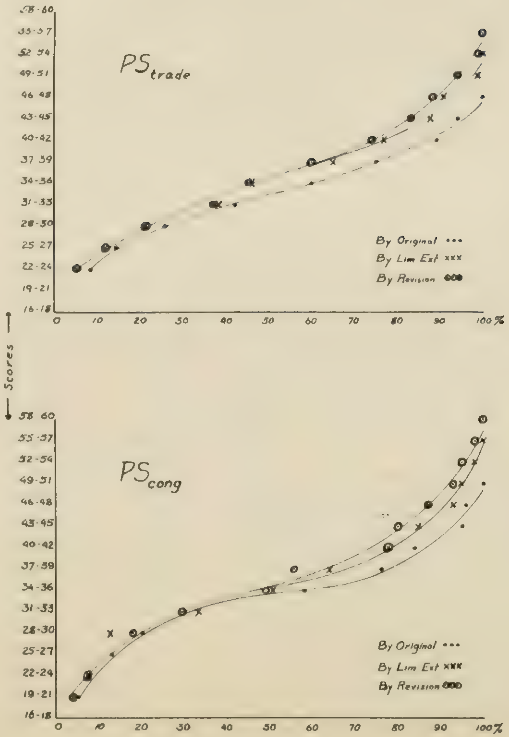


Diagram 6

Effect of Drawing Score Revision on Drawing Score Distributions

(Spreading of High End of Distribution)

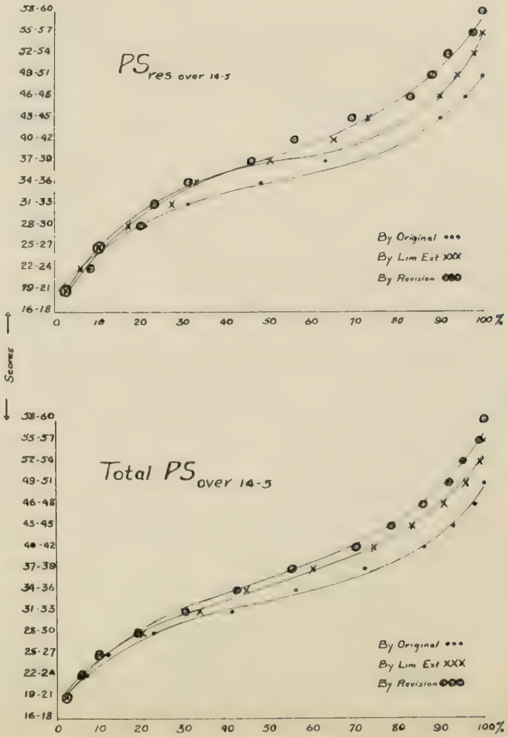
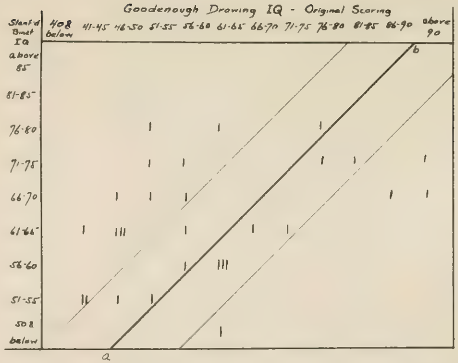


Diagram 7

N.Y.C.C.H. - Conduct Disorder



N=29

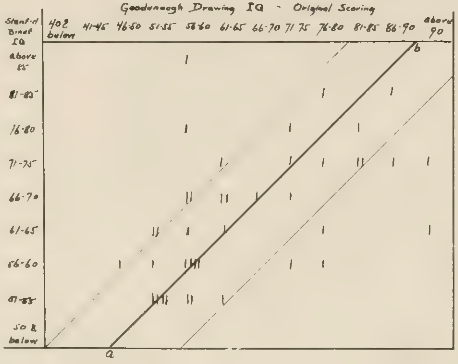
S-B : M = 64.05
SD = 8.20

GD : M = 60.95
SD = 14.60

Diff = 3.10 SD_{diff} = 3.11
$D \div \sigma_{diff}$ = .996

$D \div \sigma_{diff}$ for SB's = 0.44
for GD's = 1.46

N.Y.C.C.H. - Conduct O.K.



N=40

S-B : M = 65.0
SD = 9.50

GD : M = 65.85
SD = 12.60

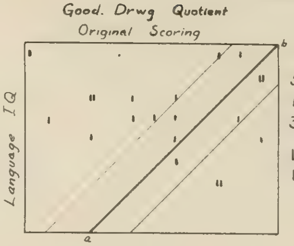
Diff = 0.85 SD_{diff} = 2.50
$D \div \sigma_{diff}$ = 0.34

Note: Lines in these diagrams have no reference to regression, but serve merely to set off three distinct areas in the distributions, as explained in the text

Diagram 8

Groups Matched for CA, MA, IQ (Language Test)

PS res over 14-5



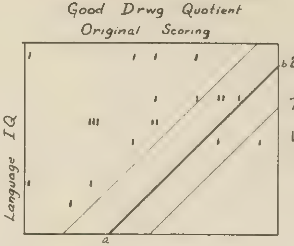
50 % within ± 10 points of Lang. IQ
15 % more than 10 points above Lang IQ
35 % " " " " below " ""

Lang. Test Mean IQ 104.0 SD 8.4
Drawing " Q 96.0 " 16.5

$D \div \sigma_{diff}$ = 1.9

$D \div \sigma_{diff}$ for Lang's = 0.17
" Drwgs. = 2.03

Delinquents over 14-5



25 % within ± 10 points of Lang. IQ
5 % more than 10 points above Lang. IQ
70 % " " " " below " ""

Lang. Test Mean IQ 103.5 SD 9.3
Drawing " Q 85.5 " 16.2

$D \div \sigma_{diff}$ = 4.3

Note: *Lines in these diagrams are not regression lines, nor have they any reference to regression. They serve merely to set off three distinct areas of the distributions, as explained in the text.*

Diagram 9

Judgments of Incongruous Drawings

Delinquents

L. M. K.

L.E.P.	No	No?	Yes?	Yes	
Yes			3	8	11
Yes?		3	7	8	18
No?	1	2	3	1	7
No	13	13	3	1	30
	14	18	16	18	66

45 %
92 %
X^2 42
C = .62

L. M. K.

W.E.H.	No	No?	Yes?	Yes	
Yes	1		4	11	16
Yes?	3	5	7	7	22
No?	1	8	4		13
No	9	5	1		15
	14	18	16	18	66

53 %
92 %
X^2 48
C = .65

L. E. P.

W.E.H.	No	No?	Yes?	Yes	
Yes		1	7	8	16
Yes?	7	3	10	2	22
No?	9	3		1	13
No	14		1		15
	30	7	18	11	66

Agreement Complete 53 %
" within one Category 85 %
$X^2 = 47$
C = .64

PS cong

L. E. P.

W.E.H.	No	No?	Yes?	Yes	
Yes		1	3	3	7
Yes?	1	3	1		5
No?	3	6		2	11
No	38	2	1	1	42
	42	12	5	6	65

Agreement Complete 74 %
" within one Category 91 %
C = .68 $X^2 = 57$

Greatest Possible C
0.866
Probability of Chance Relationship is Less than one in a hundred when $X^2 = 22$ or more

PS trade

L. M. K.

L.E.P.	No	No?	Yes?	Yes	
Yes		1	2	3	6
Yes?			3	2	5
No?	11	8	8	3	30
No	29	6	2		37
	40	15	15	8	78

55 %
92 %
$X^2 = 41$
C = .59

L. M. K.

W.E.H.	No	No?	Yes?	Yes	
Yes			2	4	6
Yes?		1	3	1	5
No?	7	5	5	2	19
No	33	9	5	1	48
	40	15	15	8	78

58 %
90 %
$X^2 = 45$
C = .60

L. E. P.

W.E.H.	No	No?	Yes?	Yes	
Yes			3	3	6
Yes?		4		1	5
No?	3	14	1	1	19
No	34	12	1	1	48
	37	30	5	6	78

Agreement Complete 65 %
" within one Category 96 %
$X^2 = 64$
C = .62

Diagram 10

Motion and Posture in Drawings

W.E.H. - Judge

Lay Judges	Posture			Motion		
	Life	Stiff	Stereo	Incomp	Comp	
Comp				2	7	9
Incomp		1	3	9		13
Stereo		1	12	2		15
Stiff	6	11	7	1		25
Life	6	3		2		11
	12	16	22	16	7	73

D-Group

Agreement

62%

61%

W.E.H. - Judge

Lay Judges	Posture			Motion		
	Life	Stiff	Stereo	Incomp	Comp	
		1		1	4	6
		1		8	3	12
			2	1		3
		6	1	3		10
	2	2		1		5
	2	10	3	14	7	36

PS res Grade

Lay Judges						
Comp	1			1	7	9
Incomp				15	2	17
Stereo		1	7	1		9
Stiff	3	10	3	3	1	20
Life	13	7		2		22
	17	18	10	22	10	77

PS trade

67%

53%

Lay Judges						
		1			6	7
		2		4		6
		2	2			4
	3	11				14
	14	4		2		20
	17	20	2	6	6	51

PS res Jr HS

Lay Judges						
Comp	2			1	5	8
Incomp				6	1	7
Stereo		2	2	3		7
Stiff	6	11	1	2		20
Life	19	2		1	1	23
	27	15	3	13	7	65

PS cong

66%

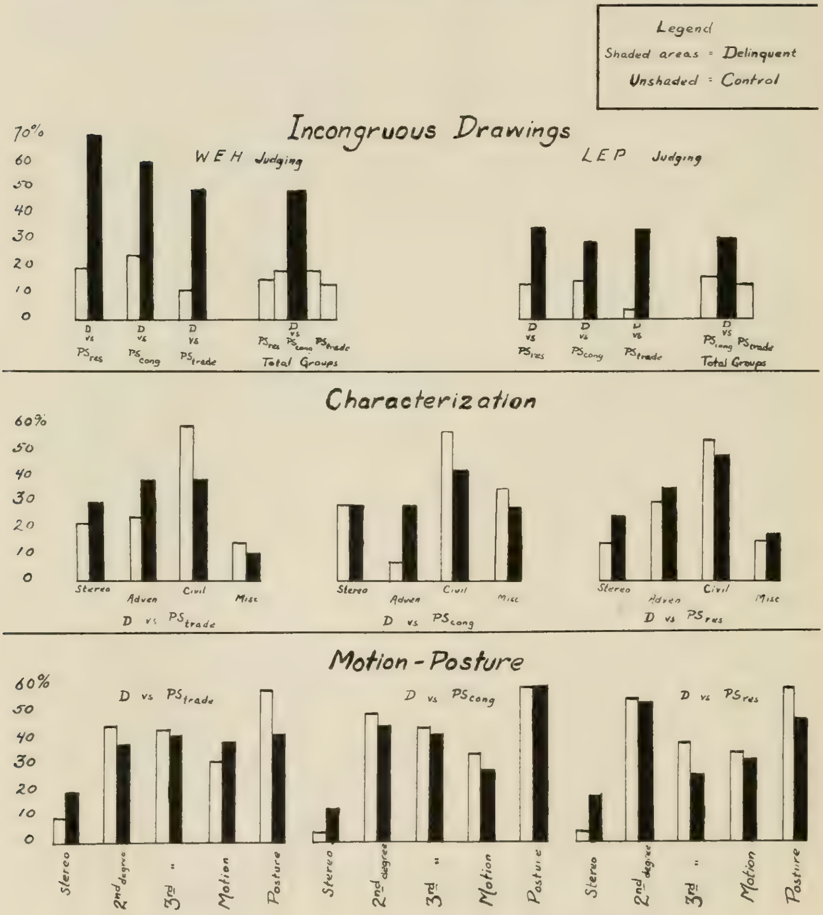
72%

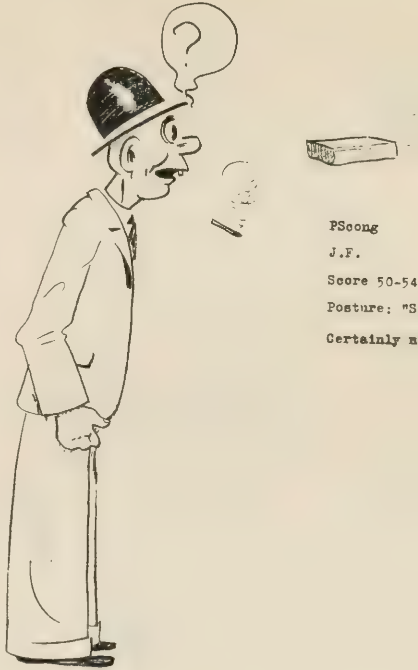
Lay Judges						
					3	3
				1		1
		1	1			2
	6	12		1		19
	9	1		1		11
	15	14	1	3	3	36

PS res Sr HS

Diagram 11

Summary Diagrams for Qualitative Differences in Matched Comparison Groups





PScong

J.F.

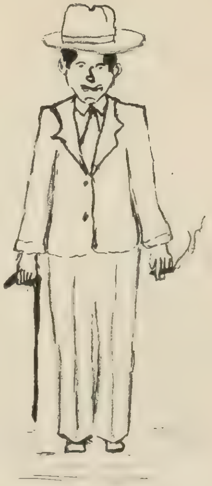
Score 50-54

Posture: "Some Life"

Certainly normal

Credit 8ax-ay 9dx 11ax 14ax 14x 14fx 15bx
also 14b 14f

FIG. 1



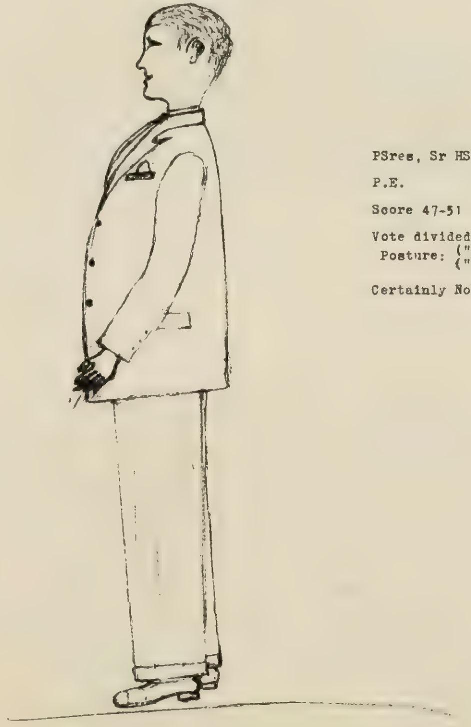
Delinq. P.V.

Certainly normal

Credit 8ax-ay 9dx 14ax 18bx
also 14b

FIG. 2

FIG. 3



PSres, Sr HS

P.E.

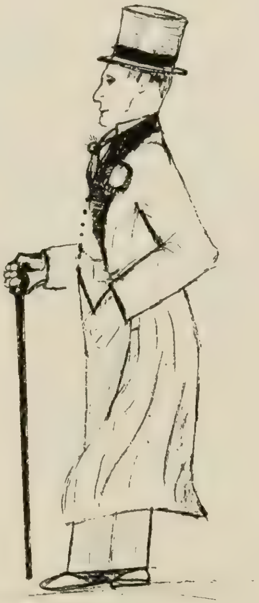
Score 47-51

Vote divided:
Posture: ("Some Life"
("Stiff"

Certainly Normal

Credit 8ax-ay 9dx 11ax 14ax 14x 14fx 15bx
also 14f but not 14b

FIG. 4



PSres, Sr HS

J.M.A.

Score 49-53

Posture: "Some Life"

Certainly normal

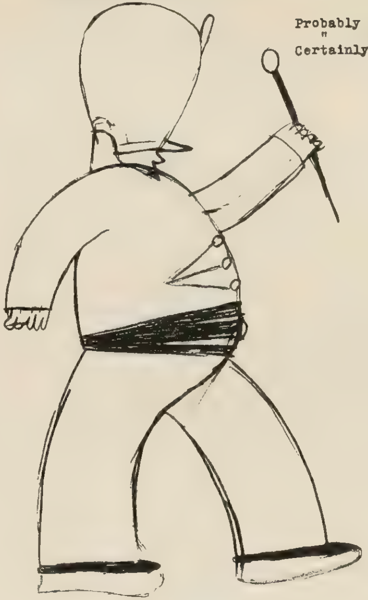
Credit 8ax-ay 9dx 11ax 14ax 14x 14fx
Also 14b 14f 15b

Delinq. J.S.

Motion quite complete

Good drwg. (as art) with infantile character in hands and feet and evasion as to face.

Probably vagarious	1 vote
" normal	2 "
Certainly "	5 "

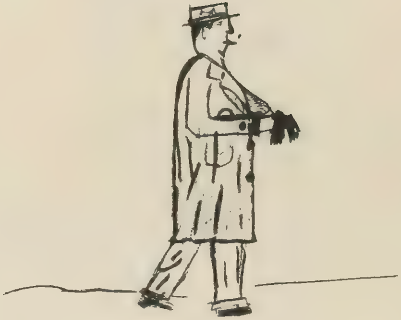


No Extension Points

FIG. 5

Delinq. S.T.

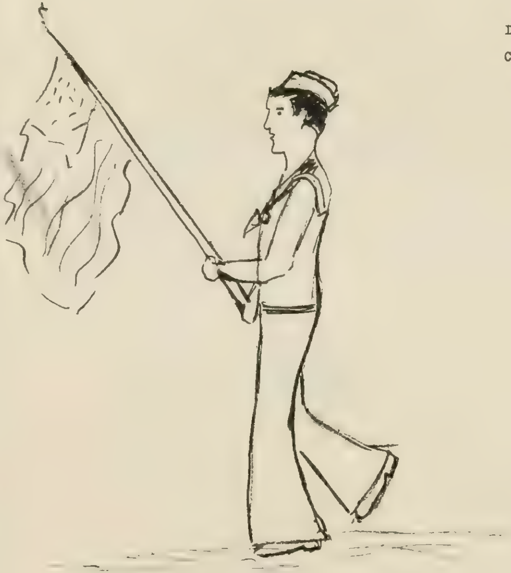
Certainly normal



Credit 8ax-ay 9dx 12x 14ax
also 14b

FIG. 6

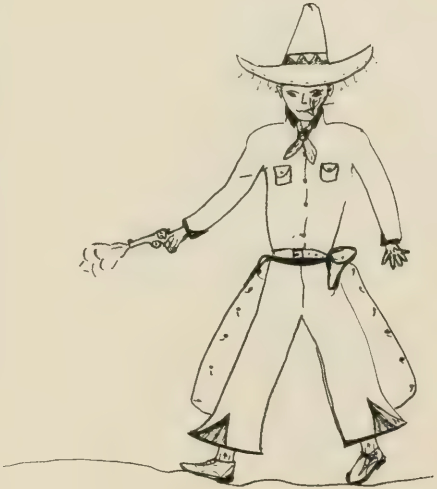
FIG. 7



Deling. E.M.
Certainly normal

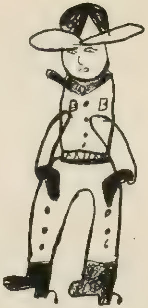
Credit 8ax-ay 11ax 11bx 14ax 14Fx 14x
also 14 F but not 14 b

FIG. 8



Delinq. W.G.
Certainly normal

Credit 9dx 14ax 14Fx 18bx
but not 14 b or 14 F

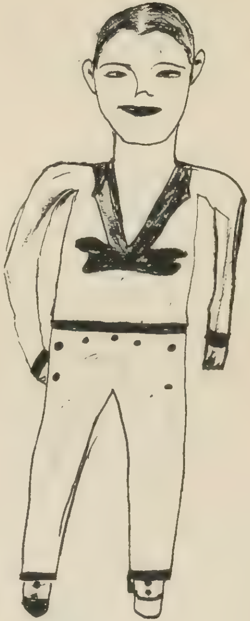


Delinq. J.J.

Probably vagarious

Credit 16 dx

FIG. 9



Delinq. J.W.

Certainly normal

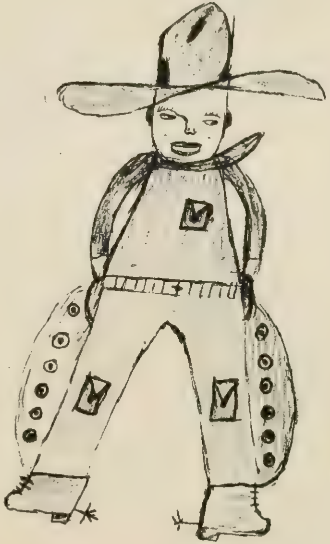
Credit 8ax-ay 14fx 18bx
but not 14f

FIG. 10

FIG. 11

Delinq. J.Z.

Probably normal



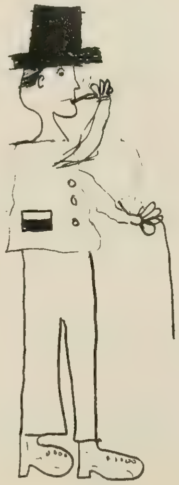
Credit 16 da

FIG. 12

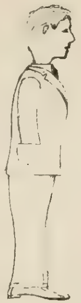
Delinq. A.S.

Probably vagarious

Borderline characterization; hardly beyond Stereotype for "Man", but may be meant for "Civilian".



Credit Bax-ay



PSoong E.K.

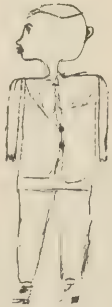
Certainly normal

Credit Bax-ay 9dx 11bx 14ax 14fx 14x
also 14 b 14F

FIG. 13

PSoong T.J.E.

Certainly vagarious) 1 vote each
Probably ")



Credit Bax-ay

FIG. 14

FIG. 15

Delinq. F.McG.

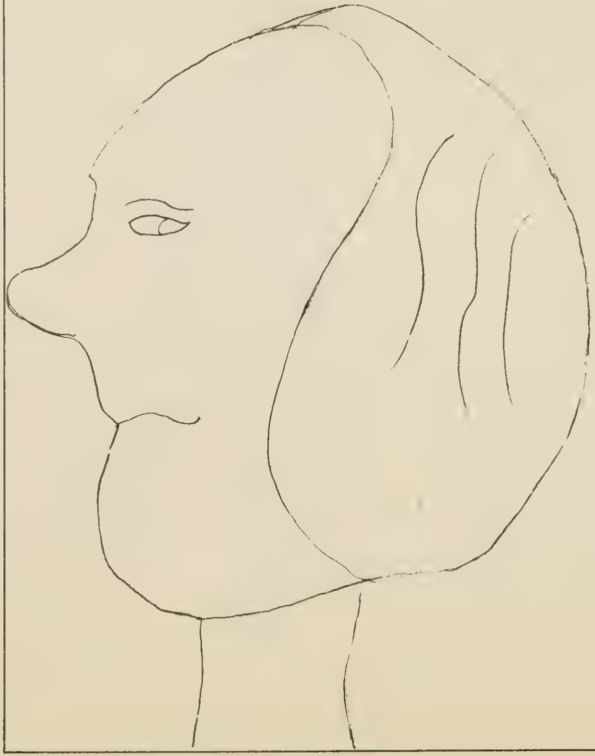
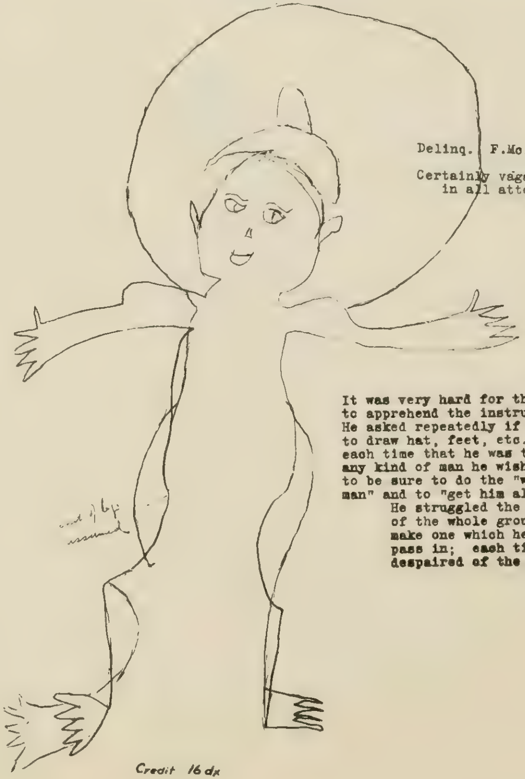


FIG. 16



Delinq. F.Mo.

Certainly vagarious
in all attempts.

It was very hard for this boy to apprehend the instructions. He asked repeatedly if he had to draw hat, feet, etc. Told each time that he was to make any kind of man he wished, but to be sure to do the "whole man" and to "get him all there".

He struggled the longest of the whole group to make one which he could pass in; each time he despaired of the body.

[illegible] assumed

Credit 16 dx

Delinq. F.McG.

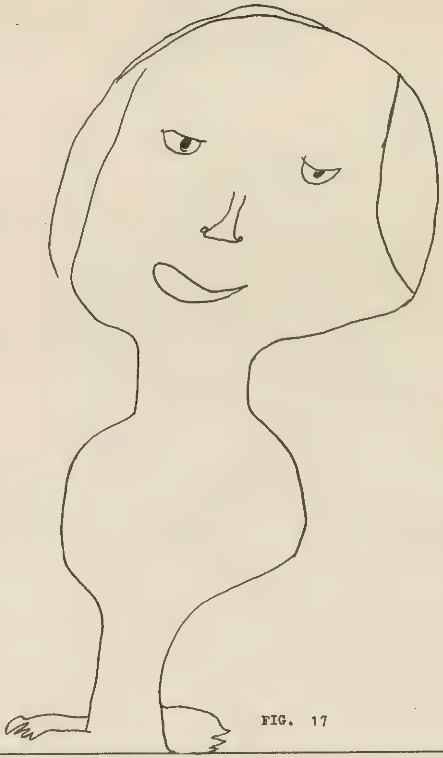


FIG. 17

Delinq. F.McG.

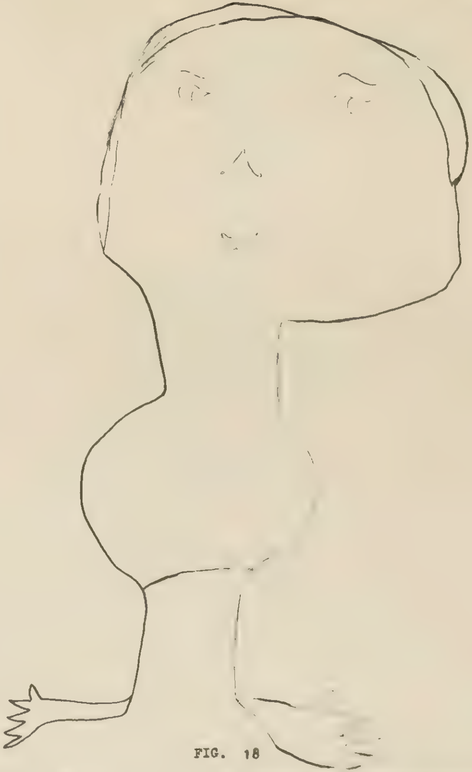
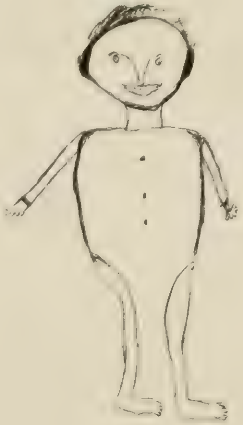


FIG. 18

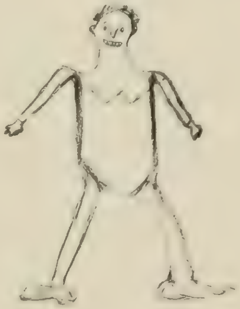
FIG. 19



PStrade S.U.

Certainly vagerious,
both this and the
following (same boy)

FIG. 20



No Extension Points

Peking. L.N.

Certainly vagarious

Other equally vagarious
attempts on reverse.

Attempt at pose:
arms hang down.

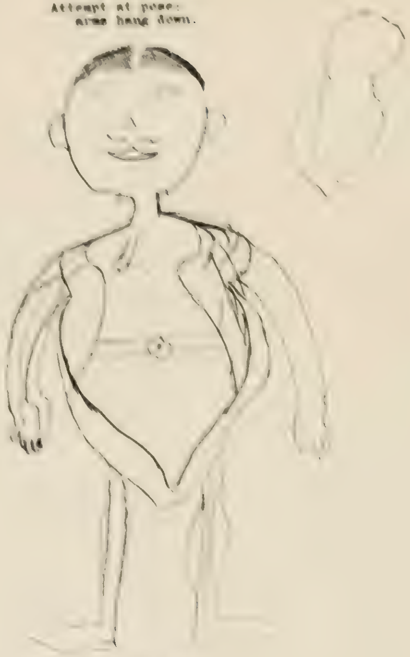


FIG. 21

Tsoong M.S.

Certainly vagarious

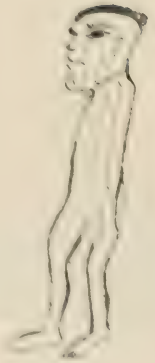
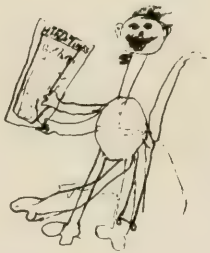


FIG. 22

FIG. 23

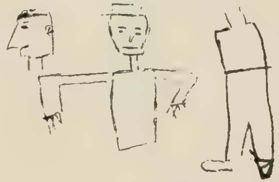


No Extension Points

Delinq. F.H.

Certainly vagarious

FIG. 24



No Extension Points

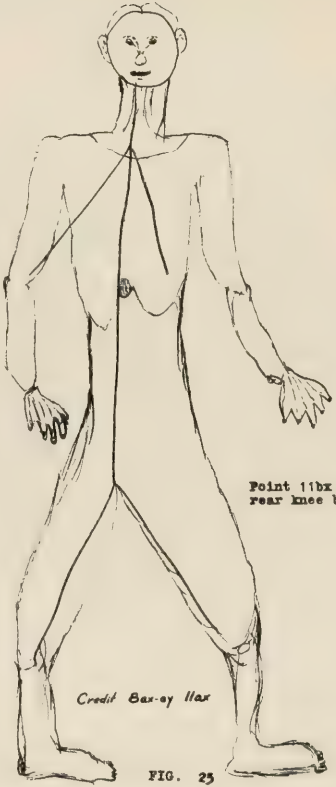
PSres, Sr HS

E.D.

Stereotype (Posture
(Character

Probably vagarious

NOTE:
These attempts were a great surprise to all who knew this boy, for he is described as: Very clever with his pencil, particulaly in doing animal subjects. But all his work is copying; he is helpless without copy.



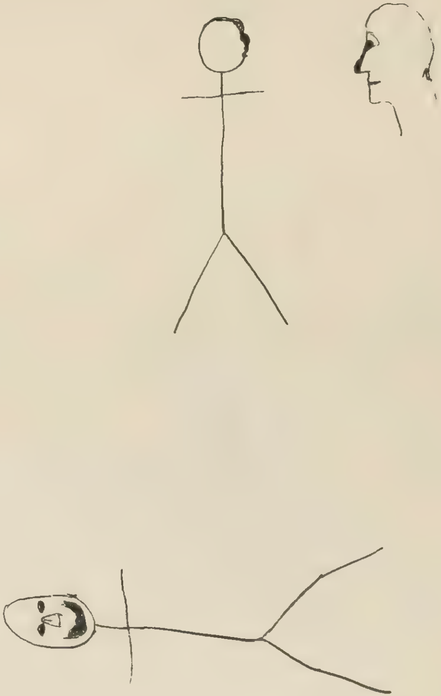
PSoong A.S.

Certainly vagarious,
with other attempts
following.

NOTE
Point 11bx of Extension not given;
rear knee bent as no knee can bend.

Credit Bax-ey Ilax

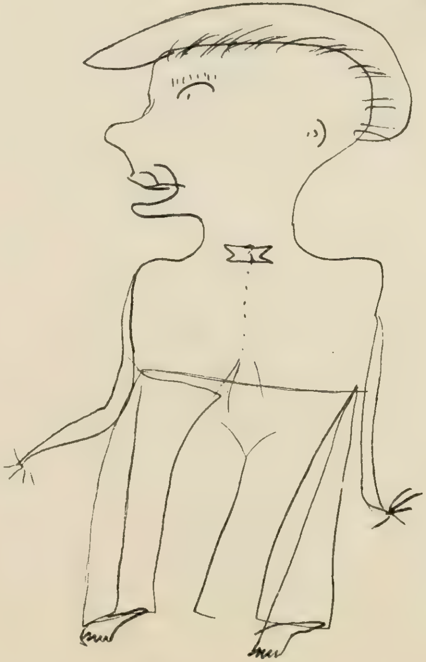
FIG. 25



PSsong A.S.

FIG. 26

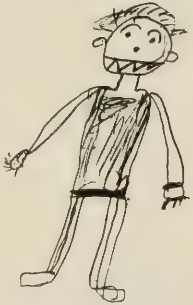
FIG. 27



Delinq. M.A.
Certainly vagarious

No Extension Points

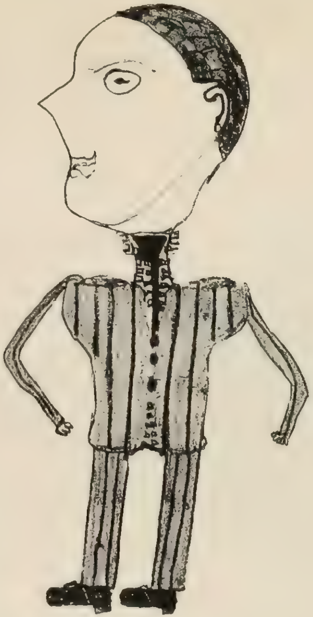
FIG. 28



Delinq. E.F.
Probably vagarious

No Extension Points

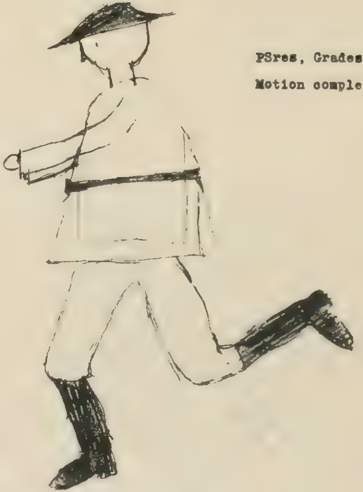
PSoong H.L.
Certainly vagarious



Credit 8ax-ay 14ax 15bx
but not 14b

FIG. 29

PSres, Grades R.R.C.
Motion complete

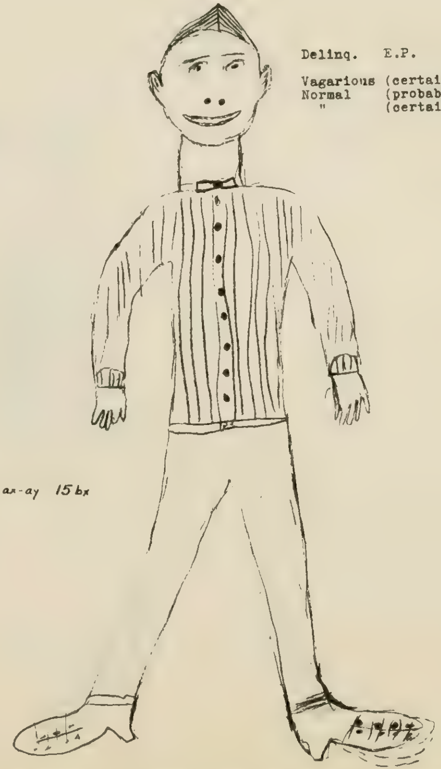


No Extension Points

FIG. 30

retreating

FIG. 31

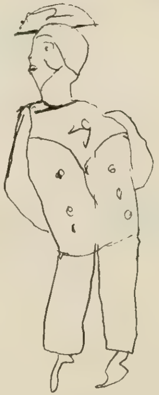


Delinq. E.P.

Vagarious (certainly) 1 vote
Normal (probably) 2 "
" (certainly) 2 "

Credit 8ax-ay 15bx

FIG. 32



Delinq. W.L.

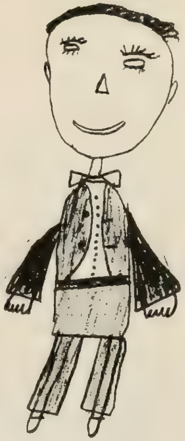
Certainly vagarious

(Boy has no chronic tremor of hand.)

8ax-ay

Delinq. C.K.

Certainly	vagarious	2	votes
Probably	"	2	"
"	normal	1	"

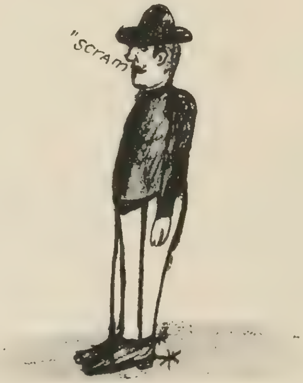


Credit Bax-ay

FIG. 33

Delinq. S.B.

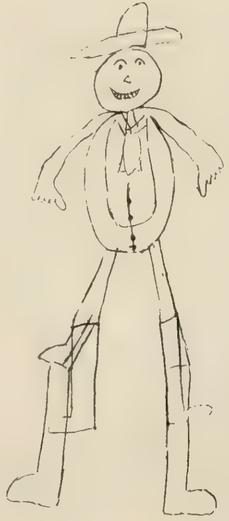
Certainly normal



Credit Bax-ay 11 bx 14ax 14Fx 14x
also 14F but not 14b

FIG. 34

FIG. 35



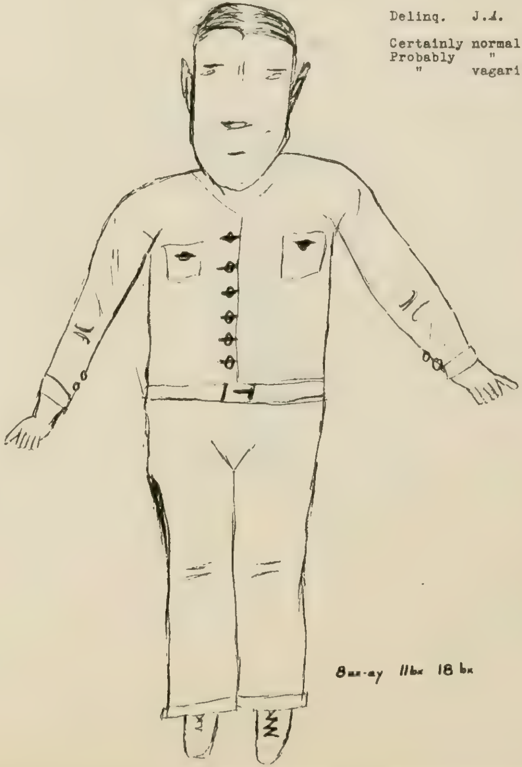
Delinq. D.D'A.

Probably vagarious) 1 vote each
" normal)

Stereotype for:
(Motion-Posture
(Characterization

No Extension Points

FIG. 36



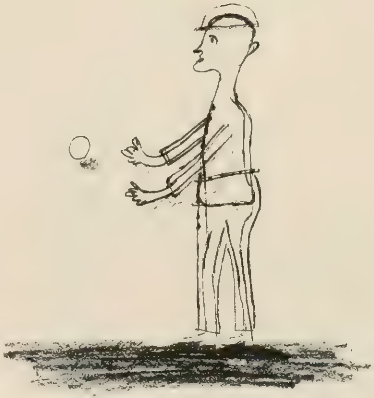
Delinq. J.A.

Certainly normal 2 votes
Probably " 3 "
" vagarious 2 votes

8xx-ay 11bx 18 bx

PStrade   A.T.

Probably vagarious

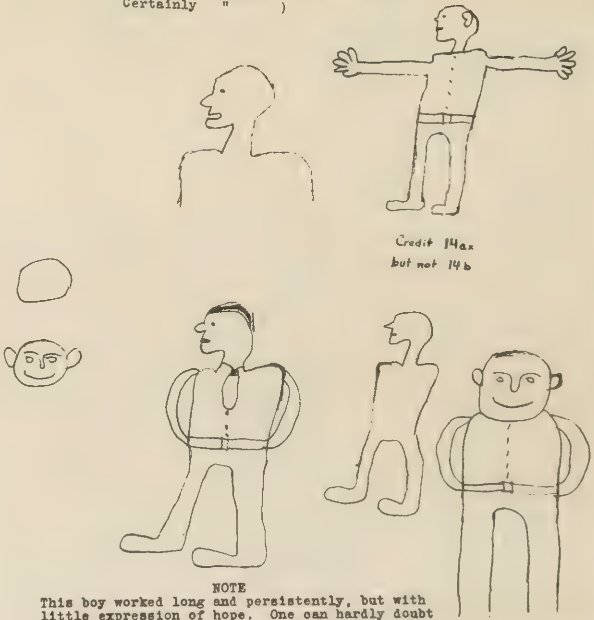


Credit 8ax-ay

FIG. 37

Delinq.   A.P.

Certainly vagarious)
Probably   "   )   1 vote each
   "   normal   )
Certainly "   )



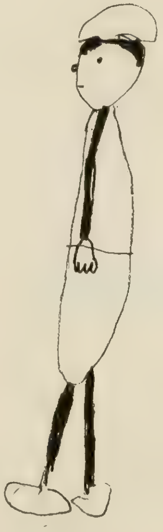
Credit 14ax but not 14b

NOTE

This boy worked long and persistently, but with little expression of hope. One can hardly doubt his co-operation, or the general level of his drawing, though a more confident approach might have raised his score somewhat.

FIG. 38

FIG. 39

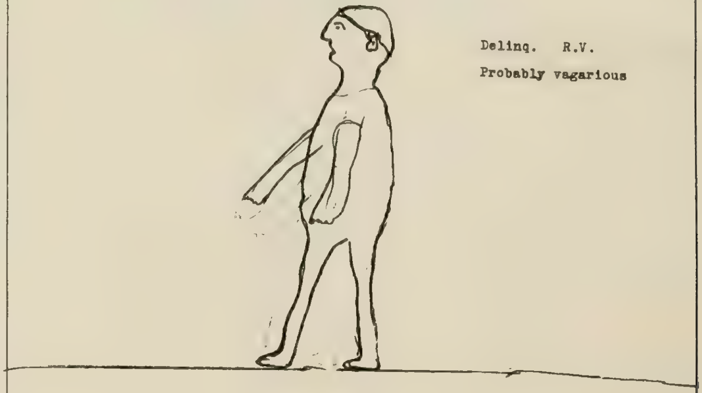


PSres, Grades M.B.

Vote divided:
(Stereotype
(Incomplete motion

Credit Bax-ay

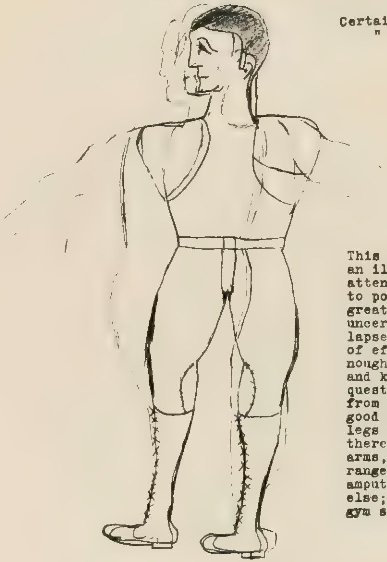
FIG. 40



Delinq. R.V.

Probably vagarious

Credit Bax-ay



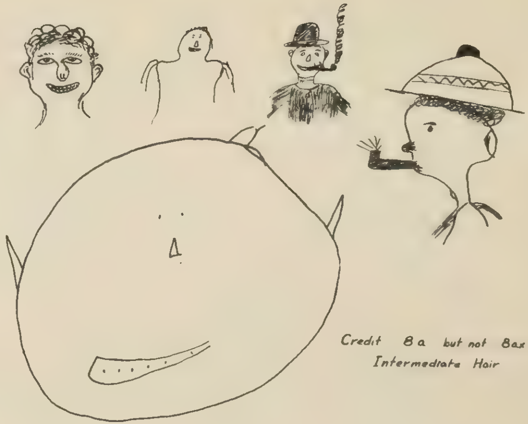
SH&S T.P.

Certainly vagarious) 1 vote each
" normal)

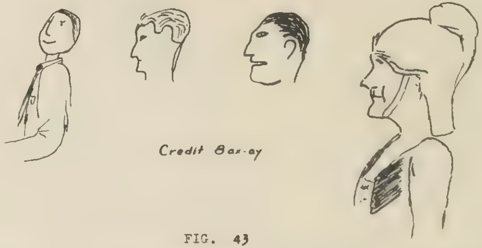
This drawing is of interest as an illustration of considerable attention to detail and ability to portray it, together with great confusion, some degree of uncertainty, and an inexplicable lapse of attention or giving up of effort. There is almost enough detail in the boot lacings and knee patches to raise a question about Extension 9dx; from shoulder to knee there is good Full Face, but the lower legs are profile (impossible); there are good indications of arms, erased; the present arrangement is not correct for amputation of arms, or anything else; and why is he dressed in gym shirt and riding breeches?

FIG. 41

FIG. 42



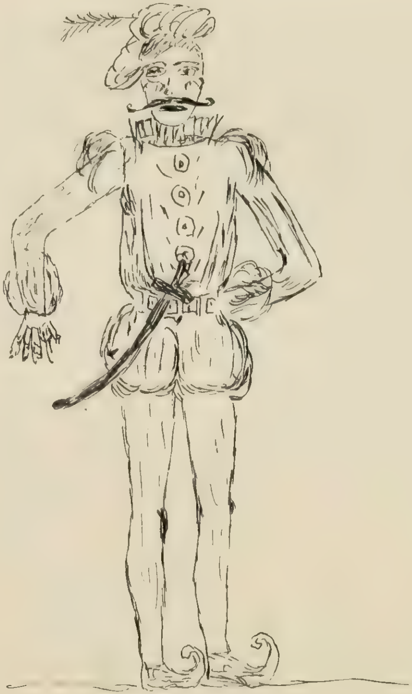
Credit 8a but not 8ax-ay
Intermediate Hair



Credit 8ax-ay

FIG. 43

FIG. 44



Credit for 9 dx questioned, but finally given.

FIG. 45

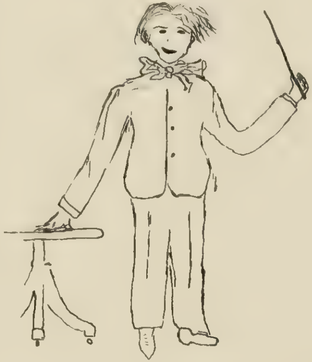
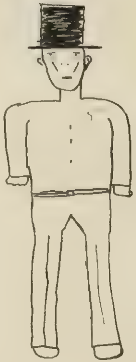
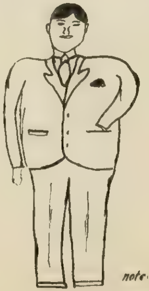


FIG. 46



Credit 9d , but not 9 dx Clothing Detail



note. no shoes or feet in original

FIG. 47

Credit 9 dx

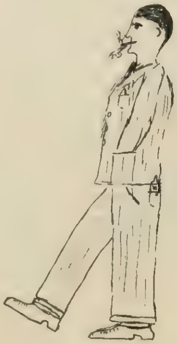
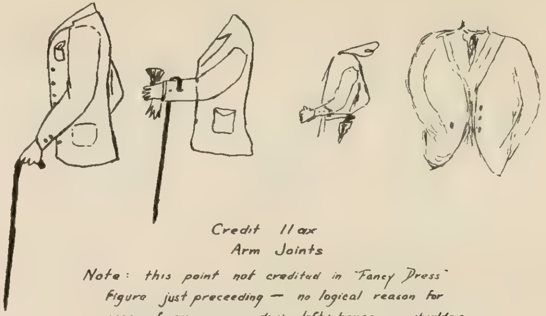


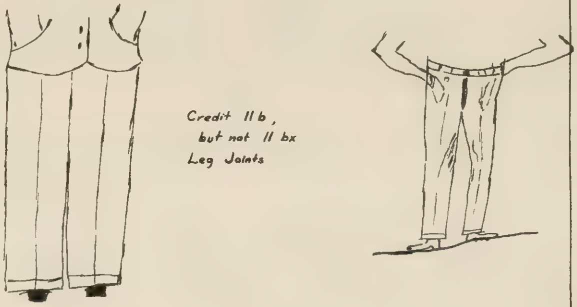
FIG. 48

FIG. 49



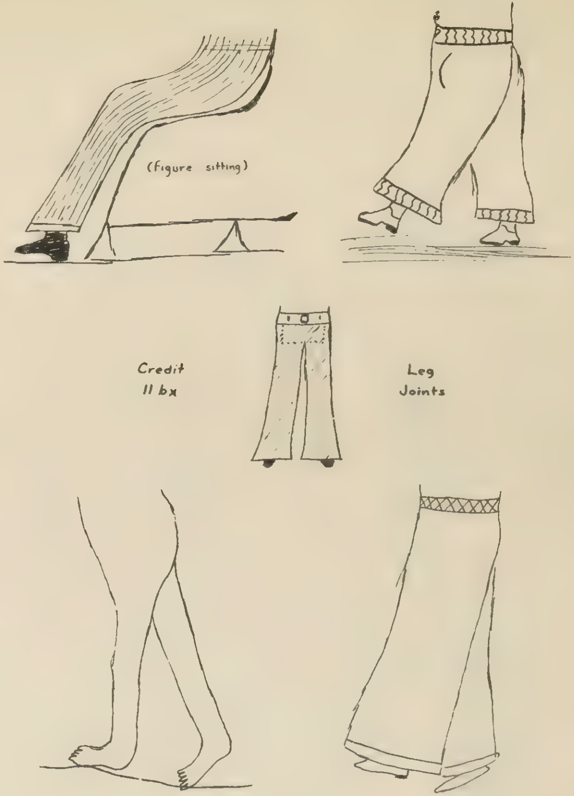
Credit 11ax
Arm Joints

Note: this point not credited in "Fancy Dress" figure just preceeding — no logical reason for pose of arm on reader's left: hence no shoulder.



Credit 11b,
but not 11 bx
Leg Joints

FIG. 50

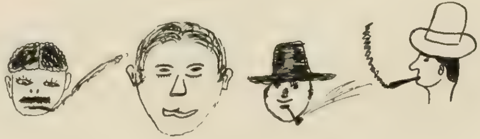


Credit
11 bx

Leg
Joints

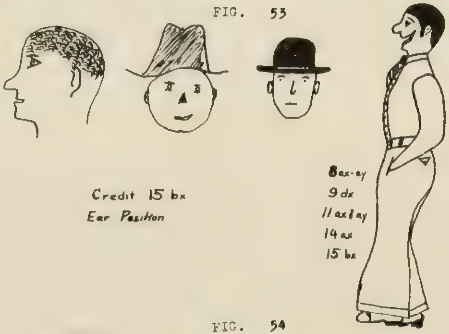
FIG. 51

FIG. 52



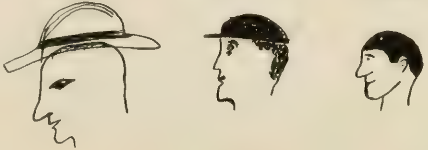
Credit 15b, but not 15 bx
Ear Position

FIG. 53



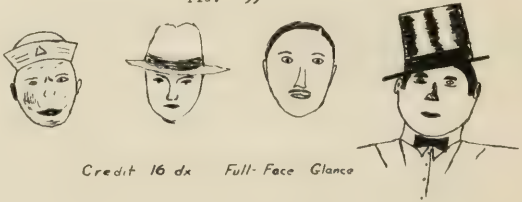
Credit 15 bx
Ear Position

FIG. 54

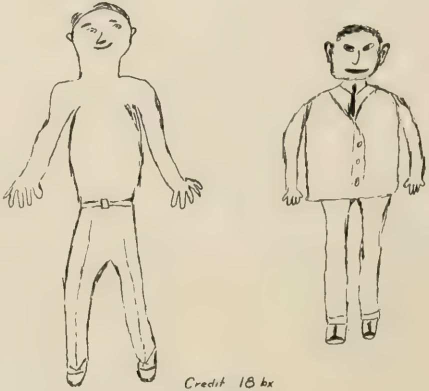


Credit 14 fx, but not 14 f
Regularity of Features

FIG. 55



Credit 16 dx Full-Face Glance



Credit 18 bx
"Good Full-Face"

FIG. 56

R.W.B. JACKSON LIBRARY
3 0005 03037630 8

150.8
A673
no.175
Archives of Psychology

150.8
A673
no.175
Archives of Psychology

ARCHIVES OF PSYCHOLOGY

List of numbers, continued from inside front cover

96. Value of Tests of Emotional Stability Applied to Freshmen: E. G. Flemming. $1.00.
97. Vocabulary Information Test: A. L. Weeks. $1.00.
98. Effect of Practice on the Mastery of an Animal Maze: S. A. Cook. 80c.
99. Recognition Time as a Measure of Confidence: G. H. Seward. $1.00.
100. Precision and Accuracy: G. W. Hartman. 80c.
101. Group Test of Home Environment: E. M. Burdick. $1.50.
102. Effect of Material on Formal Syllogistic Reasoning: M. C. Wilkins. $1.25.
103. Effect of Incentives on Accuracy of Discrimination: H. C. Hamilton. $1.25.
104. Validity of Norms to Urban and Rural Groups: M. E. Shimberg. $1.25.
105. Blood Pressure Changes in Deception: M. N. Chappell. 80c.
106. Experimental Comparison of Psychophysical Methods: W. N. Kellogg. $1.25.
107. Measurement of Verbal and Numerical Abilities: M. M. R. Schneck. $1.00.
108. Perseverative Tendency in Pre-School Children. H. M. Cushing. $1.00.
109. The Effect of Training in Junior High School Shop Courses: L. D. Anderson. 80c.
110. Music Appreciation: M. J. Adler. $1.50.
111. Motivation in Fashion: E. B. Hurlock. $1.00.
112. Equality Judgments in Psychophysics: W. N. Kellogg. $1.00.
113. Illusions in the Perception of Short Time Intervals: N. Israeli. 80c.
114. The Reading-Recitation Process in Learning: Skaggs, Grossman, Krueger & Krueger. 80c.
115. Factors Affecting the Galvanic Reflex: R. C. Davis. $1.00.
116. Infant's Feeding Reactions During the First Six Months: R. Ripin. 80c.
117. Measurement of Mental Deterioration: H. Babcock. $1.25.
118. Phenomenon of Postural Persistence: L. S. Selling. $1.00.
119. American Council on Education Rating Scale: F. F. Bradshaw. $1.00.
120. Group Factor in Immediate Memory: A. Anastasi. $1.00
121. Individual Differences in the Sense of Humor and Temperamental Differences: P. Kambouropoulou. $1.00.
122. Suggestibility in Normal and Hypnotic States: G. W. Williams. $1.00.
123. Analytical Study of the Conditioned Knee-Jerk: G. R. Wendt. $1.25.
124. Race Differences in Numerical and Verbal Abilities: J. Dunlap. $1.25.
125. Errors of Measurement and Correlation: E. E. Cureton. $1.25.
126. Experience Factors, Test and Efficiency of Women Office Workers: N. Bird. $1.00.
127. Delayed Reactions of Infants: C. N. Allen. 80c.
128. Factors Measured by the Thorndike Intelligence Examination: J. G. Peatman. $1.00.
129. Educational Success and Failure in Supernormal Children: J. Regensburg. $1.75.
130. Effect of Practice on Visual Perception of Form: J. P. Seward. $1.00.
131. Relation to College Grades of Factors other than Intelligence: D. Harris. 80c.
132. Psychological Differences Between "Racial" and National Groups: O. Klineberg. $1.00.
133. Emotional Diff. of Delinquent and Non-Delinquent Girls: A. Courthial. $1.25.
134. Learning and Retention of Pleasant and Unpleasant Activities: H. Cason. $1.25.
135. Investigation of Brightness Constancy: R. B. MacLeod. $1.25.
136. The Rorschach Test Applied to Feeble-Minded Group: S. J. Beck. $1.00.
137. Retention after Intervals of Sleep and of Waking: E. B. van Ormer. $1.00.
138. Stimulus Temperature and Thermal Sensation: F. Heiser. $1.00.
139. Energy Cost Measurements on Curve of Work: H. J. Schubert. $1.00.
140. Technique for the Measurements of Attitudes: R. Likert. 80c.
141. Speed Factor in Mental Tests: P. H. DuBois. 80c.
142. Further Studies on the Memory Factor: A. Anastasi. $1.00.
143. An Experimental Study on Variability of Learning: S. E. Asch. $1.00.
144. Inventory for Measurement of Inferiority Feelings: R. B. Smith. $1.50.
145. The Psychological Effects of Oxygen Deprivation: R. A. McFarland. $1.50.
146. Relation of Subliminal to Supraliminal Learning: O. A. Simley. 80c.
147. Effects of Noise upon Certain Psychological Processes: F. L. Harmon. $1.25.
148. Conditioned Responses in Children: G. S. Razran. $1.50.
149. Resemblance of Parents and Children in Intelligence: M. C. Outhit. $1.00.
150. Influence of Oral Propaganda Material upon Attitudes: K-C. Chen. 80c.
151. Negative or Withdrawal Attitude: H. Pallister. 80c.
152. Judgment in Absolute Units as a Psychophysical Method: J. Bressler. $1.00.
153. Visual Illusions in the Chick: C. N. Winslow. $1.25.
154. Measuring Teaching Efficiency Among College Instructors: G. W. Hartmann. 80c.
155. Psychogalvanic Responses in Arithmetical Work: R. Sears. $1.00.
156. Group Factors in Mental Tests: M. Smith. $1.00.
157. . . . Brightness Discrimination Habit in the Chick: A. B. Wood. 80c.
158. Accuracy of perception of visual musical stimuli: A. Roe. $1.00.
159. Effect of Practice Upon Individual Differences: R. E. Perl. $1.00.
160. Antagonistic Muscle Action During the Initiatory Stages: D. J. Wilson. $1.00.
161. Verbal, Numerical and Spatial Abilities of Young Children: B. Schiller. $1.00.
162. Organization of Memory in Young Children: A. I. Bryan. $1.00.
163. Self-Estimates of Improvement in Repeated Tasks: N. Kneeland. $1.25.
164. Biochemical Study of the Metabolism of Mental Work: H. Goldstein. $1.00.
165. Attitudes and Unemployment: O. M. Hall. $1.00.
166. Change of Socio-Economic Attitudes under Motion Picture Propaganda: S. P. Rosenthal. 80c.
167. Methodology of the Digit-Span Test: J. G. Peatman & N. M. Locke. 80c.
168. Effect of Repetition on Reactions to Electric Shock: J. & G. Seward. $1.50.
169. Experimental Comparison of the Speech, the Radio, and the Printed Page . . . : W. H. Wilke. 80c.
170. The Psychophysical Measurement of Visual Sensitivity: F. C. Thorne. $1.00.
171. The Psychological Analysis of Fashion Motivation: E. D. Barr. $1.25.
172. The Relation between Basal Metabolism and Mental Speed: J. Steinberg. 80c.
173. Written Composition & Characteristics of Personality: Allport, Walker & Lathers. $1.25.
174. Block Building Activities of Young Children: F. M. Guanella. $1.25.
175. Goodenough Drawings in Relation to Delinquency . . . : W. E. Hinrichs. $1.25.

DIRECTORY OF
AMERICAN PSYCHOLOGICAL PERIODICALS

American Journal of Psychology—Ithaca, N. Y.; Cornell University.
Subscription $6.50. 624 pages annually. Edited by M. L. Washburn, K. M. Dallenbach, Madison Bentley, and E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

Journal of Genetic Psychology—Worcester, Mass.; Clark University Press.
Subscription $14.00 per year; $7.00 per volume. 1000 pages annually. (2 volumes.) Edited by Carl Murchison. Quarterly. Child behavior, animal behavior, and comparative psychology. Founded 1891.

Psychological Review—Princeton, N. J.; Psychological Review Company.
Subscription $5.50. 540 pages annually. Edited by Howard C. Warren. Bi-monthly. General psychology. Founded 1894.

Psychological Monographs—Princeton, N. J.; Psychological Review Company.
Subscription $6.00 per volume. 500 pages. Edited by Herbert S. Langfeld. Published without fixed dates, each issue one or more researches. Founded 1895.

Psychological Index—Princeton, N. J.; Psychological Review Company.
Subscription $4.00. 300–400 pages. Edited by Walter S. Hunter and R. R. Willoughby. An annual bibliography of psychological literature. Founded 1895.

Psychological Bulletin—Princeton, N. J.; Psychological Review Company.
Subscription $6.00. 720 pages annually. Edited by Edward S. Robinson. Monthly (10 numbers). Psychological literature. Founded 1904.

Archives of Psychology—New York, N. Y.; Columbia University.
Subscriptions $6.00. 500 pages per volume. Edited by R. S. Woodworth. Without fixed dates, each number a single experimental study. Founded 1906.

Journal of Abnormal and Social Psychology—Eno Hall, Princeton, N. J.; American Psychological Association.
Subscription $5.00. 448 pages annually. Edited by Henry T. Moore. Quarterly. Abnormal and social. Founded 1906.

Psychological Clinic—Philadelphia, Pa.; Psychological Clinic Press.
Subscription $3.00. 288 pages. Edited by Lightner Witmer. Without fixed dates. (9 numbers). Orthogenics, psychology, hygiene. Founded 1907.

Journal of Educational Psychology—Baltimore; Warwick & York.
Subscription $6.00. 720 pages. Monthly except June to August. Edited by J. W. Dunlap, P. M. Symonds and H. E. Jones. Founded 1910.

Psychoanalytic Review—Washington, D. C.; 3617 10th St., N. W.
Subscription $6.00. 500 pages annually. Edited by W. A. White and S. E. Jeliffe. Quarterly. Psychoanalysis. Founded 1913.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company, 700 pages annually. Experimetal. Subscription $7.00. Bi-monthly. Edited by S. W. Fernberger. Founded 1916.

Journal of Applied Psychology—Athens, Ohio.
Subscription $5.50. 400 pages annually. Edited by James P. Porter. Bi-monthly. Founded 1917.

Journal of Comparative Psychology—Baltimore, Md.; Williams & Wilkins Company.
Subscription $5.00 per volume of 450 pages. Three volumes every two years. Edited by Knight Dunlap and Robert M. Yerkes. Founded 1921.

Comparative Psychology Monographs—Baltimore, Md.; The Johns Hopkins Press.
Subscription $5.00. 400 pages per volume. Knight Dunlap, Managing Editor. Published without fixed dates, each number a single research. Founded 1922.

Genetic Psychology Monographs—Worcester, Mass.; Clark University Press.
Subscription $7.00 per volume. Bimonthly, one volume per year. Edited by Carl Murchison. Monthly. Each number one complete research. Child behavior, animal behavior, and comparative psychology. Founded 1925.

Psychological Abstracts—Eno Hall, Princeton, N. J.; American Psychological Association.
Subscription $6.00. 700 pages annually. Edited by Walter S. Hunter and R. R. Willoughby. Monthly. Abstracts of psychological literature. Founded 1927.

Journal of General Psychology—Worcester, Mass.; Clark University Press.
Subscription $14.00 per year; $7.00 per volume. 1000 pages annually. (2 volumes.) Edited by Carl Murchison. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

Journal of Social Psychology—Worcester, Mass.; Clark University Press.
Subscription $7.00. 500 pages annually. Edited by John Dewey and Carl Murchison. Quarterly. Political, racial, and differential psychology. Founded 1929.